MARINE REVIEW.

VOL. XVI. CLEVELAND, O., SEPTEMBER 23, 1897. No. 13.

Over-Loaded Ships.

The schooner H. A. Kent, which foundered off Stanard rock, Lake Superior, on Thursday night last, was laden with 1,674 gross tons of ore. To the practical vessel man of the lakes who knows what the Kent was capable of carrying when properly loaded, this correct statement of her cargo will prompt some reflections. Not long ago the canal schooners of the lakes (so called on account of having been built of light draft to suit Welland canal traffic) were practically wiped out in the fall gales of two or three years on account of being overloaded. In a few seasons of high freights they were put into the ore traffic after channels had been deepened to about 16 feet. They were built for 14-feet draft, or less. At this draft, no sea, however great, would bother them. But when they were overloaded, in a desire to take advantage of profitable freights, they soon disappeared from the lakes, and with them a great many poor souls perished. May we not expect a repetition of these catastrophes in the present disposition to load wooden vessels of 13-foot hold to the deep draft of 17½ feet provided in lake channels by government expenditures of millions of dollars for deep-draft steel ships—not the old wooden schooners of days gone by?

It is not the aim of this article to signal out the owner of the Kent as the only offender in this matter of loading down old wooden vessels to a deep draft for which they were never intended. She was the best schooner in the fleet of wooden vessels to which she belonged, as she was given a thorough rebuild last winter, but the fact remains that when she foundered she was loaded with fully 100 more tons of iron ore than she should carry with chances of favorable weather. Other owners of vessels of the same kind may be charged with a desire to take advantage of the full limit of draft, but a forcible objection would be raised if a load-line was advocated; and yet who can say that the underwriters would not be justified in demanding the establishment of load-lines under such circumstances, or that the ordinary humane feeling for the lives of men endangered on such vessels should not prompt the adoption of extreme measures looking to their safety? By all means, let the owners of lake ships take into account the awful risk of loss of life through overloading vessels that were not intended for deep-draft brought about by dredged channels. If this is not done, the losses of the coming fall will certainly outnumber the worst catastrophies in the days of canal schooners.

Points for Ship Masters.

Commander Jewell, light-house inspector of the tenth district, announces that the positions of black gas buoys Nos. 3 and 5, marking the Ballard's reef channel, Detroit river, have just been changed. Buoy No. 3 is now 975 yards above buoy No. 1, and buoy No. 5 is 975 yards above buoy No. 3. The position of buoy No. 1 has not been changed. These three buoys are in a line parallel with the axis of the channel and about 25 feet to the westward of its western limit. Buoy No. 5 is about 430 yards S. E. by E. ½ E. from Ballard reef light-vessel. The black spar buoy, which formerly marked a ledge of rock in this channel, has been discontinued, the ledge having been removed. "In navigating this channel," says Commander Jewell, "its eastern side should be avoided while the improvements are in progress, on account of the rocks that may be thrown out in blasting." The engineers in charge of the improvements at this point have also found it necessary to again say to vessel masters that they must not follow the Duff & Gatfield ranges for the present, as they will thus be led to the eastward of the deep water and encounter boulders where the contractors are at work.

John H. Maloy of the steamer W. H. Stevens is the latest captain to report an encounter with a rolling stone or obstruction of some kind in the channel near Amherstburg. "The obstruction," he says, "is about 250 feet north of the red buoy marking what is sometimes called Spokane shoal. When we struck we were heading down clear of the red light on the stake, say 75 to 100 feet west of it, and we were drawing about 14 feet 10 inches." It is understood that government employees on the river are now at work sweeping for this or any other obstructions that may be in the channel between Wigle's mill and New York shoal.

Reports to underwriters and to officials of the Lake Carriers' Association are to the effect that there are now full 20 feet of water over the wreck of the Grand Traverse, sunk near the mouth of the Detroit river. The wreckers have recovered the pony pump, capstan, and two deck trucks from the wreck of the steamer, and have cut the wreck off below decks except about 20 feet on one side. Rubbish will be cleared away as far as possible in a few days, and then there will be 26 to 30 feet of water over the wreck.

In a letter to George L. McCurdy of Chicago, Capt. Harvey Stewart of the steamer Sauber says that on the 12th inst., when rounding the "Shank" (Waugoshance), his vessel struck a rock or some other obstruction. He gives the following bearings: Gray's reef, S. W. by W.; "Shank," S. E. ½ E. with Rose shoal one or one and one-quarter miles distant. The Sauber was drawing 17 feet and 17 feet 4 inches; possibly when running she was down to 18 or 18½ feet.

Lieut. Charles S. Ripley, who has been in charge of the Chicago branch hydrographic office for the past two years, has been detached and ordered to report for duty on board the U. S. S. Marblehead at New York city, Oct. 21. He will be succeeded on Oct. 23, by Lieut. Simon Cook, recently detached from the U. S. S. Puritan.

Dimensions of the Chicago Ship Building Co.'s enlarged dry dock are: Length over all, 525 feet; length on blocks, 500 feet; width at top, 100 feet; width at bottom, 80 feet; width of gate, 70 feet; depth over sill, 18 feet.

American Citizens for the Navy.

Since the return to Washington of Lieut. John M. Hawley, U. S. N., who has been in charge of the establishment of temporary naval recruiting stations on the lakes, it has been announced that with the closing of the station at Buffalo, now in charge of Ensign N. E. Irwin, this work will be discontinued for the present on the lakes. But Lieut. Hawley will very probably recommend to the secretary of the navy the establishment of a permanent recruiting rendezvous at Chicago; not because the navy is short of the number of men allowed by law, but because of the experienced men who were found willing to enter the navy from the lakes. The number of applicants of all kinds who presented themselves for enlistment at each of the temporary stations on the lakes was greater than could now be conveniently used in the service, and this is why Toledo, Cleveland and other places were skipped. The percentage of those who successfully passed the exacting physical examination was very large, being over 50 per cent. at all points. All the men enlisted have been sent to the receiving ship Vermont at New York, and most of them have already been assigned to duty on ships in active service. None but American citizens were enlisted and no boys not born in this country. Lieut. Comdr. Hawley will suggest to Secretary Long the advisability of a visit of a recruiting board to establish temporary recruiting stations at Savannah, Mobile, New Orleans and other southern ports. He finds that in all the lake towns and seaports there are large numbers of promising sailormen and mechanics of American citizenship who have not the money to pay their expenses to the recruiting ships, but who gladly enlist when the recruiting officers come to them and their expenses to the receiving ships are paid. They constitute a class that it is very desirable to induce to enter the navy, and the first experiments in recruiting them have met with signal success. It is the policy of the department to weed out the foreign element in the personnel of the navy as rapidly as possible.

Lake Freight Matters—New Ships.

The northwestern grain movement has not up to this time been as heavy as was expected, and although the soft coal miners have now been at work for several days, the shipments of coal by lake during the present week have been little in excess of shipments during the strike period. The first supplies of coal had to be distributed in all directions, and a shortage of cars also prevented a large movement to the lakes. It is again expected that within a few days these delays will be overcome and the freight market improve accordingly. In the meantime the ore trade is the main support of lake shipping, and there is every indication that ore will continue moving to the full capacity of the producing interests until the close of the season. Some sales are being made right along by the few dealers who are not sold up to their full output. The iron market grows stronger each day without a boom in prices, and the best feature of it is an assurance of a heavy business running well into another year. Markets for Bessemer pig iron all over the country are strong, and the demand for foundry iron within the past week has been more urgent than it has ever been in the history of the iron trade. This is certainly a most encouraging report, as consumers of this kind of iron represent a trade that is far reaching in its various elements.

Ship builders are figuring on several vessels, contracts for two of which in Cleveland will probably be closed in a few days.

No Discriminating Duty.

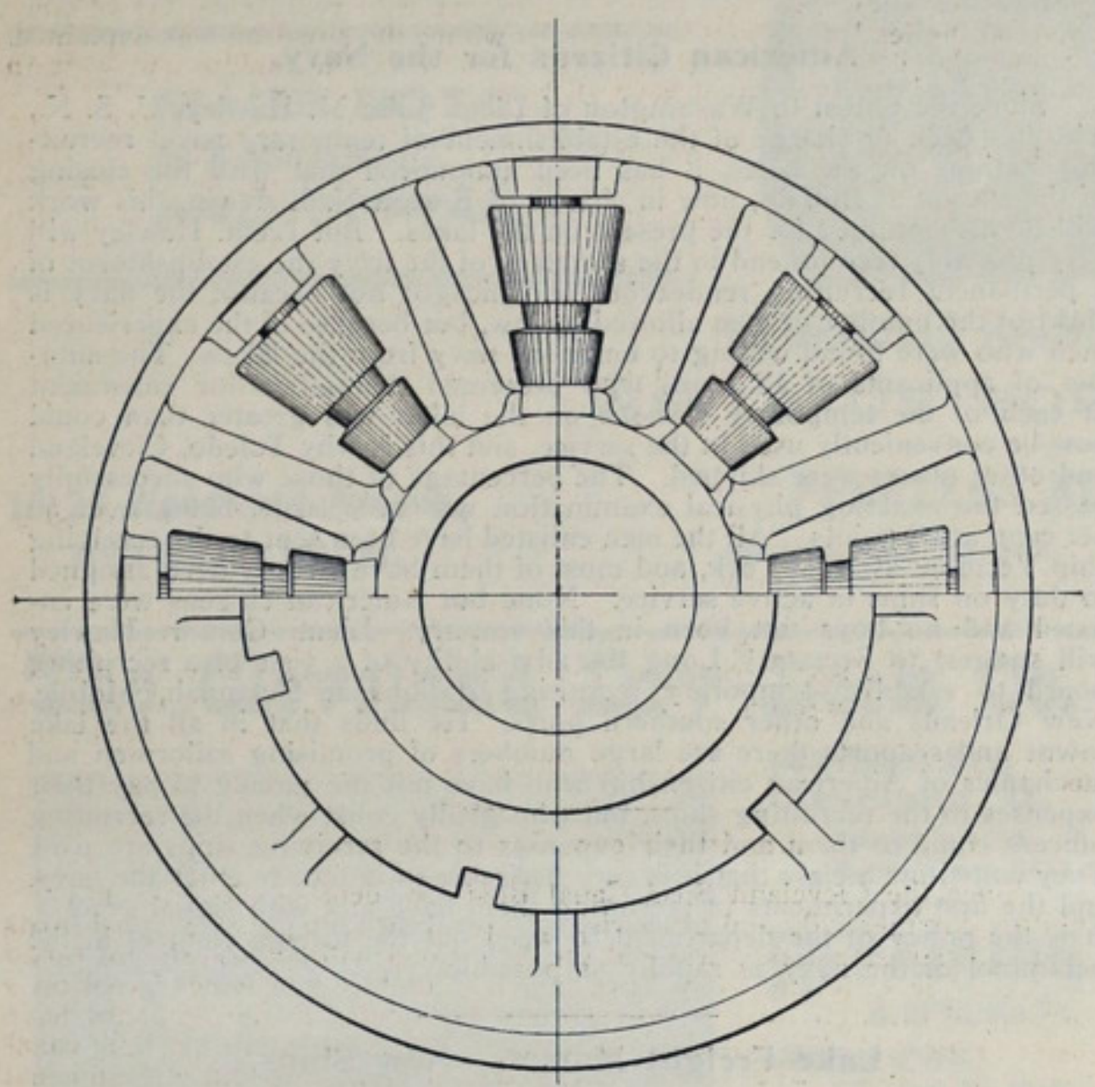
After all the fuss that has been raised during several weeks past about the discriminating duty section of the new tariff bill, Attorney General McKenna has finally rendered a decision that practically nullifies the work of whoever it was that made the changes in the language of the section while the bill was in the hands of the conference committee, without the committee or either of the houses of congress knowing what those changes were expected to effect. In other words, this section of the tariff act, in accordance with the decision of the attorney general, will permit of the collection of discriminating duties only in such cases as have been provided for in every tariff act for a third of a century.

This is just as it should be. The friends of American shipping, as far as they are concerned in this matter, want no assistance from "sneaked" legislation. It was admitted after the passage of the tariff bill that neither the senate nor the conference committee was aware of the effect of the alterations in section 22, even if it was known that any changes had been made. Under these circumstances, the decision of the attorney general, in addition to being legally correct, is also a just decision. Let the fight in favor of assistance for our mercantile marine, which is certain to be made in the next congress, be conducted on such clean lines as to prove that none of the friends of American shipping have had anything to do with the changes that were made in the tariff act.

Directors of the Cleveland & Buffalo Transit Co. are getting around to the point of authorizing the construction of another side-wheel steamer similar to the City of Buffalo, but it is not probable that the contract will be let in time to have the new steamer in service next year. The C. & B. company is in the same position that the Detroit & Cleveland company found itself after building their first big boat, the City of Cleveland. Everybody wanted to ride on the City of Cleveland. She was crowded all the time, and the smaller boat on the line was poorly patronized. The company was forced to build the City of Detroit, which was practically a duplicate of the City of Cleveland. The Cleveland & Buffalo line management is now experiencing a similar condition of affairs.

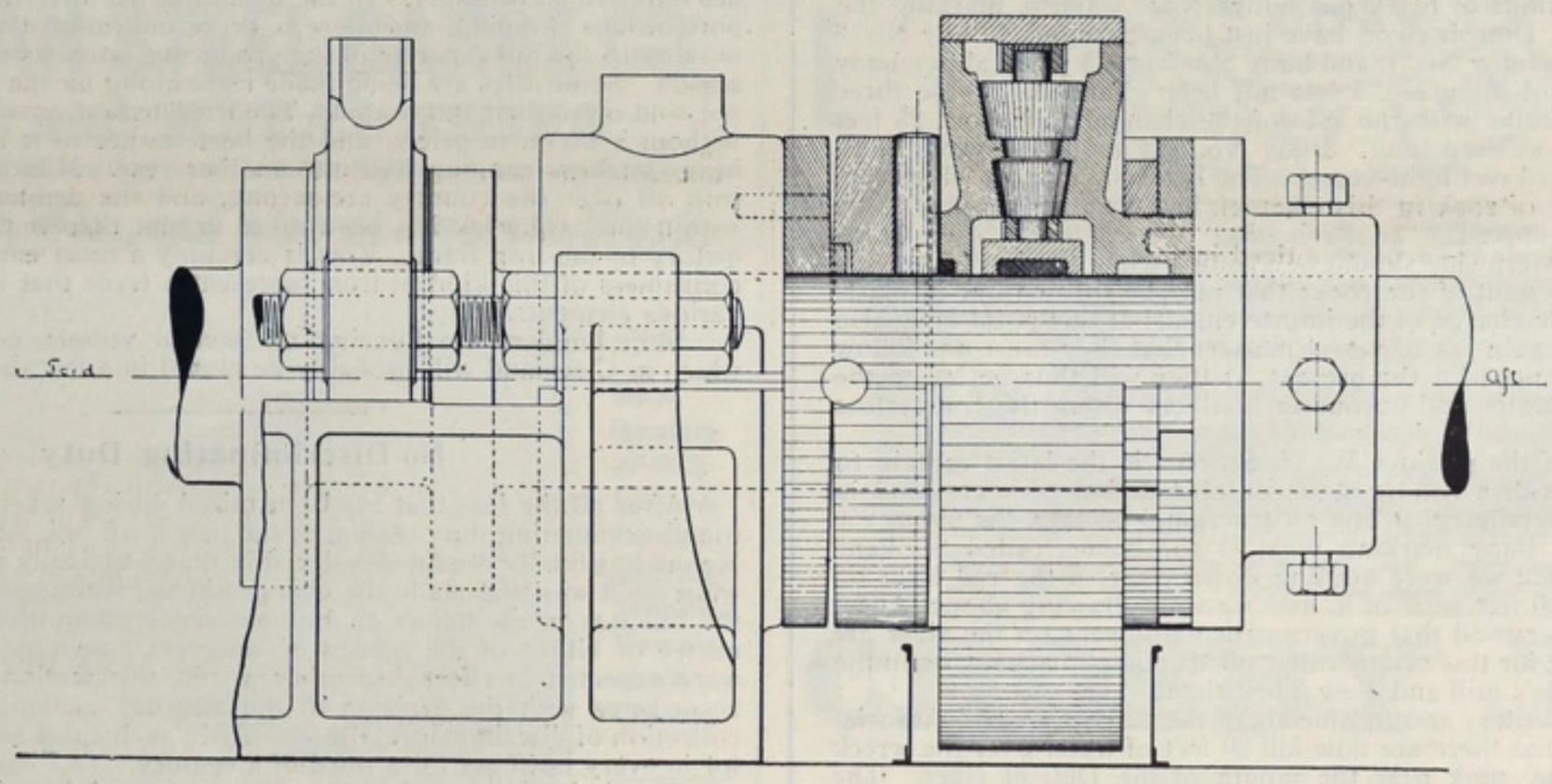
Universal Roller Thrust Bearing.

A patent universal roller thrust bearing, that has been given thorough trial on several lake vessels, is illustrated in the accompanying engravings which were made from working drawings. It is manufactured by the patentee, Michael Schmalty, of Bay City, Mich. The drawing shows the bearing as usually applied to marine engines, having the ordinary horseshoe thrust and steady bearing combined; and the forward thrust from the



roller bearing is taken by the steady bearing, the horseshoes being used for backing purposes only.

The bearing consists of a universal device, the steel rollers running between two disks and a device for taking up wear and tear. The universal device consists of two steel rings tapered at slight angles towards two



steel pins, which are placed at right angles against each other, thus permitting strain on the rollers to be equalized when shafting is slightly out of true line. These rings rest directly against steady bearing and are held stationary by steel dowse pins. The bearing proper consists of a number of conical steel rollers running between two cast steel disks, the forward one being stationary against the universal device and the after one driven by a collar securely clamped to the shaft. The rollers are made of tempered tool steel and grooved, as shown in the drawing, so as to take the end thrust. Ends of the rollers are held in position by two steel rings united by radial arms, and fitted with bronze journals for rollers. In addition to the grooves, the outer ends of the rollers are designed to take part of the outward thrust by working against a bronze or copper washer, placed endways in the outer journals and supported by the outside ring. The after end of the steel disk is threaded for two steel adjusting rings, provided with slots or notches for spanner wrenches, so that any wear or tear can easily be adjusted by locking the rings against each other in the proper fore and aft position.

This bearing has been in use for the last three years on several large raft-towing tugs owned in Bay City, and also on a high-speed triple expansion engine making 400 revolutions per minute under 200 pounds steam, and has given excellent satisfaction wherever tried. Having considerable less friction than the ordinary thrust bearing, the number of revolutions gained when tested in comparison with the horseshoe bearing has been from six to twelve per minute, all other conditions being equal. The patentee has received many unsolicited testimonials from owners and captains of crafts using this roller bearing, and recently it has been fitted aboard one of the largest tugs on the lakes, Capt. James Reid's Protector, which has a compound engine of 22 and 40 inches by 28 inches stroke, and which is reported to have gained by the use of it ten revolutions per minute. Further information regarding this device may be had from Mr. Sven Anderson, manager of F. W. Wheeler & Co.'s ship and engine building plant, West Bay City, Mich.

Big Ships of Nickel Steel.

Prof. J. H. Biles of Glasgow University says that if nickel steel were now the same price per ton as mild steel, there seems to be no reason why it should not be at once adopted for large vessels, either war or mercantile. But it is not produced at present for much less than three times the price of mild steel. In a paper dealing with "Improved Materials of Construction and their Influence on Design," read before the British Institution of Civil Engineers, Prof. Biles writes very interestingly of questions of construction involved in the use of nickel steel as a material for ships. He concludes with a summary of the effect which the adoption of nickel steel would have upon the design of a 10,000-ton ship.

"It may be assumed," says Prof. Biles, "that nickel steel, 50 per cent. stronger than mild steel, can be produced with certainty. The relative weight of parts subjected to longitudinal stress may be reduced 33 1-3 per cent. If we assume that to resist compressive strains we have to reduce frame spacing, and can only take advantage of the increased strength of the material to the extent of one-half, we shall only gain 16 2-3 per cent. in transverse framing material. The total gain in a 10,000-ton ship will be 1,000 tons on a weight of 6,000 tons--this is 16 2-3 per cent. It was found in passing from iron to mild steel that from 1½ to 3½ per cent. was added by increased weight of butt straps, laps, etc., and though a smaller percentage would probably be added in this case, some allowance should be made. It seems as if from 14 per cent. to 15 per cent. of the weight of steel could be saved. This reduction in the weight of hull can be used to increase weight of machinery and coal. The extra speed resulting therefrom in a 20-knot ship will be 1¼ knots with an extra total coal consumption of 13 per cent. To produce a mild steel vessel carrying the same dead weight of cargo and having 21¼ knots speed, the dimensions would have to be increased by 10 per cent., the horse power by 40 per cent., the first cost by 20 per cent., say $350,000 (supposing passenger accommodation to remain the same). Supposing the cost of workmanship is the same in a nickel steel vessel of the same dimensions as in one of mild steel (it will probably be less), we should have as the only difference in first cost of the two vessels that between 6,000 tons of mild steel and 5,000 tons of nickel steel. The former might cost $200,000, but the latter could hardly cost $200,000 plus $350,000, which would be $550,000; and anything below this would be in favor of the nickel steel ship, both in economy of first cost and in economy of upkeep. The coal bill in the mild steel ship would be 19½ per cent. more than in the nickel steel ship. The 5,000 tons of nickel steel could probably be bought at present for $375,000, leaving a balance of $175,000 of saving. These figures are given to show the great value which increase of strength of material has upon the design of a ship and upon its first cost. In other types of ships savings in weight and engine power could be effected. In the low-powered ships the gain would be less. Take the case of a 14-knot Atlantic ship of about 7,000 tons in addition to coal to do her voyage. She could carry 10 per cent., 700 tons more cargo, if built of nickel steel. A mild steel vessel large enough to carry this extra cargo and maintain the same speed would cost $50,000 more. This, added to the cost of the mild steel in the vessel carrying 7,000 tons, would give a sum which would enable the builder to pay $45 per ton for the nickel steel. The extra cost at $75 per ton would be about 15 per cent. of the first cost of the vessel. As there would be only 5 per cent. less of coal and machinery expenses paid out to repay the extra first cost, it is doubtful whether, at $75 per ton in a vessel of this size, it would pay to build in nickel steel. It will be of interest to know what chance there is of this material being produced much more cheaply. No reference has been made to reductions in weight of machinery due to the adoption of nickel steel and their effect upon design."

Lake Michigan Passenger Steamers.

Chicago, Sept. 22.—As a result of the season of prosperity in lake passenger business, the Goodrich Transportation Co gives out information of important changes to be made in several of its steamers, and it is announced that the whaleback passenger steamer Christopher Columbus, which has just finished a successful season, will pay a dividend to her owners for the first time in her history. Whatever may be said to the contrary during the winter, it is certain also that the Christopher Columbus will again be on the Chicago-Milwaukee route next season. The announcement that the Goodrich company will expend over $100,000 during the coming winter in remodeling and lengthening three of its steamers is correct, although plans pertaining to these changes have not as yet been fully arranged. The most important changes will be in the twin-screw steel steamer Virginia, which has of late been given up during the main part of the season, the summer months, to excursion business on the Chicago-Milwaukee route. The Virginia, when built some five years ago, was designed for the business the Indiana is in now—night service between Chicago and Milwaukee—but as it is intended to keep her in the excursion business, she must be changed to meet requirements of this traffic. It has been decided to give her an increased length of 50 to 60 feet and increase her speed to twenty-one miles per hour. Instead of cutting the steamer in two and putting the addition in amidships, as is usual, the forward plating will be taken off and the bow extended, in order to give the vessel finer lines forward. The top of the present skylight in the cabin will be taken off, and a cabin placed above with glass sides. This cabin will not have staterooms, but will be for the accommodation of excursionists wholly. It will extend clear across the deck to the inner edge of the walk around the hurricane deck. Two additional boilers, 11 feet in diameter, will be given the steamer, in order to still further increase the speed. With the changes in the bow and the additional steam supply, it is planned that the Virginia can make the run between Chicago and Milwaukee in four hours. Mr. Frank E. Kirby of the Detroit Dry Dock Co. has been figuring with the Goodrich company on these changes, and the Chicago Ship Building Co. will also be asked to submit bids on the work, which will probably involve an expenditure of $75,000. Radical changes of this kind in a steamer like the Virginia will, of course, attract considerable attention from steamboat men. During the season just closed the Virginia has carried more people than during any other season since she came out of the ship yard and began running between Chicago and Milwaukee.

Plans for changes in the steamer City of Ludington are already prepared. About 15 feet will be added to her length. This addition will be at the stern. The Ludington will be given a new boiler and engines. The latter will be fore-and-aft compound, with cylinders 22 and 44 inches in diameter by 36 inches stroke. This with a boiler 14 feet by 11 feet, is expected to give her a speed of 15 miles an hour. An elegant passenger vestibule with birch finish and ten additional state rooms on the cabin deck are other changes proposed for this steamer. She will go on the Green Bay route next spring, while the Sheboygan will take her old route to Manistique.

Alterations proposed for the Indiana will probably not be made until next March. It is proposed to add 24½ feet to her length amidships, which will give eight new rooms on the cabin deck, and then to erect on the hurricane deck a house providing about thirty-two new rooms, with promenade all around, similar to the Iowa. The Indiana will be continued on the night run to Milwaukee. All of the patent pull-out frame beds in the Indiana will be taken out when other changes are being made.

Passing Signals in Fog.

Editor Marine Review:—I have noticed in several issues of the Cleveland Leader, as well as in one of the Detroit papers, interviews and communications regarding passing signals in fog. With a full knowledge of the qualifications of the several people who have been quoted on this subject, it would seem that the objection to passing signals comes from a source that should carry little weight. It is certainly not in order for J. W. Westcott, or a writer of paragraphs on a newspaper, who happens to have some sort of a certificate in the English marine, to dictate to practical men of the lakes as to how they shall handle their ships. Everybody knows that these men have had no pracical experience in the navigation of lake vessels. Does it not seem absurd, then, to listen to their attempt to advise men of well-known reputation as masters of ships? Why should they assume to enter into a controversy on a subject of this kind with men like Capt. James Stone, Capt. D. P. Wright and others? For them, my advice is to keep out of this discussion. It is a matter too serious for the fellow who simply wants to see his name in a newspaper. Permit men who meet each other in the close quarters and narrow channels of these lakes to discuss the subject, and let them agree among themselves as to whether the passing-signal rule is right or wrong. It would seem, anyhow, that these would-be theorists holding down chairs in offices are alone disturbed on account of the use of passing signals.

Capt. D. P. Wright of the steamer Alex. Nimick presents this question in a forcible way in his recent reference to it. The point he makes about meeting one of the Northern line passenger ships is worth reprinting. "I was coming down Lake Superior in a fog, not long ago," he says, "when I heard the whistle of the North West very nearly ahead, possibly a trifle on the starboard bow. Would the kickers against the rule have felt just as easy to blunder ahead, not knowing their own or the other fellow's intention, as they would to exchange passing signals and each feel satisfied that they understood what they were doing? You may say we should slow down or stop, if necessary. We do slow down, but with a consort behind us we cannot stop. We must keep going for some distance before we can stop in that case. Two boats coming together could not avoid collision if they waited until they saw each other, when it is so thick you cannot see 800 feet ahead."

NAUTICUS.

Perry-Payne Building, Cleveland, Sept. 22, 1897.

I. O. F. excursion to Conneaut, Tuesday, Sept. 21. Special train via Nickel Plate road; $1.25 round trip; leaves 8 a. m. 319-Sept. 21

More Money Needed for Erie Canal.

Improvements in the canals of New York state involving an expenditure of $7,500,000, mainly in the Erie canal, are now completed or under contract, and the public works department finds that in order to carry out the general scheme of improvements for which $9,000,000 was provided some time ago, it will be necessary to secure an additional appropriation of $2,000,000 to $3,000,000. Before expending, therefore, the balance of $1,500,000, which is left from the $9,000,000 appropriation, the state authorities a few days ago held a conference with representatives of commercial bodies throughout the state, to whom the situation was explained. It was stated that contracts for improvement of the middle and western divisions of the Erie canal have all been let, excepting a large steel lock at Lockport, which will cost about $500,000. Quite a large stretch of the eastern division of the Erie is not, however, as yet under contract. With this explanation it was proposed, by representatives of the commercial bodies, to go ahead and complete improvement of the Erie, as it was argued that this was the main line and that advantage should be taken as soon as possible of the parts that are now completed or nearly so. But it was found that the balance on hand would not be sufficient to complete the main line, and it was therefore agreed that a part of it should go to the Oswego and Champlain canals. This was probably done for the purpose of obtaining support of the less-important canal districts in securing a new appropriation of two or three millions. It all means that the improvement of the Erie, as well as the other canals of the state, will probably be delayed much longer than was expected.

Following are the names of contractors and the amounts involved in the latest batch of contracts given out at Albany for Erie canal work: Thomas H. Carr of Troy, $74,934; J. V. Quackenbush of Mohawk, $241,288; Bauer & Hagaman of Rochester, $97,301; Troy Public Works Co. of Utica, $132,678; Clinton Beckwith of Herkimer, $122,829; Furnaceville Iron Co. of Rochester, $609,400; Baker & Banker of Gloversville, $98,760; Williams, McNaughton & Hapst of Buffalo, $184,095; Henry C. Allen & Co. of Syracuse, $105,850; Whitmore, Rauber & Vicinus of Rochester, $248,290; E. H. Gaynor of Fayetteville, $147,582.

An Old-Time Canal Scheme.

Since the Cleveland Steel Canal Boat Co. demonstrated the practicability, commercially and otherwise, of operating a line of steel canal boats that can navigate Lake Erie and the Erie canal without transfer of cargo between Cleveland and New York, a great number of schemes based on a service of through freight from western lake cities to the seaboard have been proposed. The latest of them directs attention to an old-time canal question. Away back in the '50s it was proposed to cut a ship-canal through from the head of Lake Michigan to Lake Erie, near Toledo, transform the state of Michigan from a peninsula to an island, and open up a water route on an air line between Chicago and the western end of the Erie canal. Those were the days when Lake Superior was a lonely waste of waters, but for a few copper mine villages on the Keweenaw peninsula, and no one dreamed of the immense traffic that was to pass through the St. Mary's river. The whole traffic of the great west was expected to strike the lakes at Chicago, and it seemed a waste of time for vessels, whether steam or sail, to take the long route up one side of the state of Michigan and down the other, when by cutting a ship-channel across the base of the state they might go in a straight line to Buffalo and Clinton's ditch. A survey was made, the plan pronounced feasible, but costly, and nothing more was done. As time passed on it became evident that Chicago was not to be the only watergate for western traffic. Duluth came into prominence as a grain port, and with the marvelous development of the iron ore resources of the Lake Superior region, the waterway by the Sault and St. Mary's river route became of the first importance. From time to time, when a ship-canal fever broke out and projects were aired for cutting connecting ditches between navigable sheets or streams of water wherever land barred passage from one to the other, the Michigan and Erie canal scheme bobbed up into view and disappeared as quickly. Now it has been brought up once more, and it is proposed to ask congress for another survey. This time it is not to be a big ditch, with a 20-foot waterway, through which 5,000-ton steamers can go with ease and safety, and which will cost several tens of millions. A smaller affair will do this time, a trifle of $4,000,000 or so will build it, and canal boats can be taken direct from Chicago to New York. This idea of a waterway for canal boats running direct from Chicago to the seaboard has evidently been suggested by the Cleveland enterprise.

Stock of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Sept. 18, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	2,164,000	17,241,000
Duluth	1,964,000	250,000
Milwaukee	55,000	381,000
Detroit	310,000	35,000
Toledo	328,000	584,000
Buffalo	489,000	1,644,000
	5,310,000	20,135,000

As compared with a week ago, the above figures show, at the several points named, an increase of 942,000 bushels of wheat and 1,016,000 bushels of corn. On the same date there was afloat on the lakes 2,663,000 bushels of wheat, 2,843,000 bushels of corn and 1,868,000 bushels of oats. Grain afloat on the canals aggregated 216,000 bushels of wheat, 1,299,000 bushels of corn and 71,000 bushels of oats.

Army and navy charts of the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

The Review has excellent photographs of lake ships.

Peculiar Condition of the Iron Market.

The course of the iron trade has always been peculiar. Its history is one of surprises. The unexpected happens, while that which should take place, according to general reasoning, fails to materialize. Those who have been in business for many years as iron merchants or consumers of iron are full of reminiscences of how they failed to correctly interpret trade indications, and either bought at the wrong time or failed to buy at the right time, made contracts running too far into the future or else lost fine money-making opportunities by not making long contracts. It is, in fact, not really necessary to go back further than two years to recall notable instances of mistakes made by men of national prominence in the trade. Even their superior resources for securing reliable information of the great impulses which influence general business were not trustworthy in endeavoring to read the future of iron and steel to only a limited extent.

The outlook at present is just as puzzling as at any previous time. Men are mystified by the singular steadiness of prices under the strongest of all influences. Huge contracts have been made, exceeding anything ever before known in the history of American iron and steel, until plant after plant has been forced out of the market with its order books overflowing, and yet the market appears placid. Some advances have taken place, but they have been very moderate. At any previous period of active buying the placing of so much business would have caused a "bulge" of large proportions. When the fact is considered that all the large steel works are crowded with orders for delivery up to the close of year, that they have in some cases been obliged to purchase from other works to fill pressing specifications for shipment, and that they are being urged to open their books for orders for next year's delivery, the maintenance of quotations at their prevailing low level is most remarkable. It is this persistency of low prices which makes many men uncertain as to the future. They argue that the trade in general is not yet convinced that business is on a permanently stronger footing, and they will not believe it until they see a substantial advance. A fair advance would undoubtedly be welcomed by all parties, manufacturers and consumers, but it is certainly to be hoped that it will not be unreasonable. The iron market at present is not unlike a tinder box, needing but a spark to make a flame. The great producers probably realize this, and are, therefore, continuing to quote low prices, even if they can not book the business offered.—Iron Age.

Cargo Records of Lake Ships.

Iron Ore—Steamer Empire City, owned by A. B. Wolvin of Duluth, 5,622 tons gross, or 6,296 net, Two Harbors to Cleveland, draft of 17 feet 2 inches; schooner Amazon, James Corrigan of Cleveland, 5,603 tons gross, 6,275 net, Duluth to Ashtabula, draft of 16 feet 8 inches; schooner Polynesia, James Corrigan of Cleveland, 5,477 tons gross, 6,134 net, Duluth to Fairport, draft of 16 feet 8 inches; Andrew Carnegie, Wilson Transit Co. of Cleveland, 5,425 tons gross, 6,076 net, Two Harbors to Cleveland, draft of 17 feet 4 inches.

Grain—Steamer Crescent City, A. B. Wolvin of Duluth, 225,000 bushels of corn, equal to 6,300 net tons, South Chicago to Buffalo, draft of 17 feet; steamer Empire City, A. B. Wolvin of Duluth, 205,445 bushels of wheat, equal to 6,163 net tons, Duluth to Buffalo; schooner Amazon, James Corrigan of Cleveland, 217,000 bushels of corn, equal to 6,076 net tons, Chicago to Buffalo, 16 feet 6 inches draft; steamer Crescent City, A. B. Wolvin of Duluth, 318,000 bushels of oats, equal to 5,088 net tons, Duluth to Buffalo.

Coal—Schooner Aurania, John Corrigan of Cleveland, 5,187 net tons bituminous, Toledo to Milwaukee; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 4,997 net tons of bituminous, Cleveland to Sheboygan, draft of 15 feet 2 inches.

In His Native Country.

Frederick Arsenius, who was for some time employed as draftsman with the Cleveland Ship Building Co., and who was later with the Cramps, of Philadelphia, is now in the employ of the government of Sweden, his native country. Writing to a friend in Cleveland he says: "Although I have nothing more to do with ship building, the industry on the Great Lakes will always be remembered as a remarkable example of American enterprise, energy and push, and I will follow its progress with interest. I must therefore ask you to send me an occasional copy of the Marine Review. I think I wrote you that I had been appointed a torpedo engineer in the Royal Swedish Navy, and for that reason I left the United States and sailed on the 5th of June, for these old shores. After thirteen stormy days at sea, I landed in Christiania, Norway, and from there took the railway at Stockholm. Stockholm is a beautiful city as you will have heard, but just now it is prettier than ever. There is an exhibition going on—a Northern exhibition, including Russia. It is a World's Fair on small scale and everything, buildings, mounts and exhibits, are of a high order and very artistic in appearance. The army and navy exhibits are very complete, and I was, of course, most interested in the latter. There were models from our oldest wooden frigates up to our very latest armored ships, and outside in the lake rode barges 300 years old side by side with the modern torpedo boat. The exhibition of modern artillery was very fine and it is in this respect that Sweden has made the most remarkable progress since I was home last. The new guns with their ingenious breech mechanisms, the armor plate and projectiles, were well up to anything I have seen. In other respects, too, Sweden has not been asleep, and I was well proud of my native country. I was ordered to the naval station at Carlskrona, which is a city of about 22,000 inhabitants, built entirely on an island, half of which nearly is taken up by the navy yard, which is of magnificent proportions. A hundred other islands scattered all around make natural fortresses and the place is well fortified."

Bulkheads of the United States cruiser Chicago are being equipped with a new system of watertight doors. The doors are opened or closed by hydraulic pressure from a central point, and indicators show the condition of the doors at all times. If the system proves a success the navy department may introduce it on other vessels.

A Steamboat Man of Nerve.

All praise to the steamboat captain who can run his ship alongside a sinking schooner and save the lives of her entire crew in darkness and a heavy sea on Lake Superior. It is said of J. C. Gilchrist, vessel owner of Cleveland, that he aims to select young men, and men of small stature, in preference to big men, for vessel captains. He argues that men of great physique are liable to become logy, and that the cool-headed, little fellow makes the best ship master. He has several of this latter class in his fleet, and not least among them in point of nerve and good judgment is Capt. Wm. Blattner of the steamer J. C. Gilchrist, who rescued the entire crew

of the schooner H. A. Kent on Lake Superior on Thursday night last, in a storm that was severe enough to cause the vessel to founder. Capt. Blattner's bravery is all the more commendatory from the fact that his own ship was deeply laden and the tow was in mid-lake at midnight off Standard rock when the schooner went down. Men of less nerve, to use a popular phrase, have been covered with medals.

The manner of rescuing all hands from the sinking schooner by Capt. Blattner and the crew of the Gilchrist should be noted by lake captains generally, as they may at any time find themselves called upon to perform a similar service. It was about 11:15 at night when Capt. Sullivan of the schooner signalled that his vessel was sinking. There was such a heavy sea on that it was dangerous for men on the steamer to go amidships. The captain of the Gilchrist ordered the mate's watch aft and called his own watch forward, using a speaking tube for orders. When the tow line was cast off he rounded to and came up under the schooner's stern, but the schooner, which had some sail set, forged ahead too fast for the steamer. With the second effort the Gilchrist was put alongside the Kent, but too far away to be of any assistance. On a third trial the Gilchrist came up on the Kent's quarter, the bow of the steamer lapping the stern of the schooner for about 15 feet. Heaving lines were used, as the vessels surged around too much in the sea to attempt to use a ladder. Attention was first given to the children. A line was tied under the arms of each of them in turn and they were dropped into the water from the Kent and hauled up and aboard on the Gilchrist. Within an hour from the time the schooner signalled, her entire crew was aboard the steamer, and fifteen minutes later she went down. One of the little ones saved from the Kent was a baby, and an effort was made to swing the little tot across the space between the vessels without dropping it into the water. The rope slipped, however, and to keep the child from dashing against the side of the steamer, it was allowed to drop into the water. Although it was dressed only in a night shirt its sudden bath in the cold waters of Lake Superior didn't even make it cry.

Two-Thirds of Iron Ore Output is from the Lakes.

Notwithstanding the extensive development of iron mining properties in the south of late years, especially in Alabama, Virginia and Tennessee, which states produced together in 1896 about 2,500,000 gross tons, the Lake Superior region contributes about two-thirds of the ore used in the United States, and its proportion of the entire output of the country increases each year. The relation between the total output of ore in the United States in recent years and that from Lake Superior region appears in the following, all in gross tons:

	United States.	Lake Superior.	Per Cent.
1892	16,296,666	9,564,388	58.7
1893	11,587,629	6,594,620	56.9
1894	11,879,679	7,682,548	64.7
1895	15,957,614	10,268,978	64.3
1896	16,005,449	10,566,359	66

The figures are from the portion of the 1896 report of the United States Geologic Survey that is prepared by John Birkinbine of Philadelphia.

An electric light plant is a feature of additional equipment that is being installed at the dry dock portion of the American Steel Barge Co.'s plant, West Superior.

Floating Dry Dock Crossing the Atlantic.

A floating dry dock capable of sustaining the largest vessels of the Spanish war fleet is now being towed across the Atlantic from the works of C. S. Swan & Hunter, Wallsend-on-Tyne, to Havana, Cuba, where it will be used for docking at regular intervals Spanish vessels that surround the island. Work on this big structure was rushed in England, and barring accident in the Atlantic voyage, which will be made in about six weeks, it will be delivered at Havana within the limit of eleven months provided in the contract between the English ship builders and the Spanish colonial office. The dock is being towed by the New Zealand Shipping Co.'s steamer Ruapehu, and the manilla tow line, made especially for the purpose, weighs nearly five tons, measures 22 inches in girth, and has a breaking strain of over 150 tons. For passage across the Atlantic a captain and other officers have been selected, as well as engineers and a crew of several sailors, for whom comfortable quarters have been provided.

The structure consists of three portions—the pontoons, or body of the dock, affording the required buoyancy; the high sides or walls, regulating the descent of the pontoons below the water and also affording the necessary stability; and the movable caissons or gates, that are only used when it is required to increase the lifting power of the dock. The length over all of the dock is 450 feet; the clear width between the board altars, 82 feet; the depth over the sill, 27 feet, 6 inches; the draught of water being 42 feet 6 inches, and the freeboard 4 feet 2 inches. There are five pontoons, the width of all of them being 87 feet 11 1-2 inches, the length of the rectangular ones 75 feet, and that of the pointed ones 108 feet 4 inches. There is a space of 2 feet between each pontoon. The extreme breadth of the dock is 109 feet. The dock is constructed throughout of mild steel of the quality usually employed for ship building purposes. Each pontoon is divided into four watertight compartments, and each wall is divided below the engine deck into five watertight compartments, so that the entire structure is divided into thirty watertight spaces. Each of these compartments can be emptied of water by means of an electrical pumping installation, consisting of two generating plants, one in each wall, but with connecting cables so that either can serve the whole dock. Each plant is complete with boiler, engine, and direct coupled dynamo. The pumping machinery is capable of lifting an ironclad of 10,000 tons weight in two and one-half hours, which means that 15,000 tons of water must pass through the pumps before the process of lifting is complete. The electrical machinery includes a complete system of electric lighting. In order to render the dock efficient and suitable for lifting short heavy vessels such as ironclads, a caisson is fitted at either end. The dock itself is provided with a foremost and square sails, together with a jigger mast aft and has steam steering gear, steam windlass, anchors, cables, and every minor appliance necessary for the Atlantic voyage. The electricity for pumping the water from the interior will be generated by two sets of compound vertical engines, each driving direct on to a Tyne dynamo. From the dynamos the power is transmitted to ten motors, five in each wall, which are placed directly over the pumps. The contract was signed in December last but the first plate was not laid on the blocks until Feb. 27. The dock was ready to sail about Sept. 1, so that the entire work was completed in practically six months.

In General.

Forgings in the engine of the torpedo boat Rogers—built by the Columbian Iron Works & Dry Dock Co. of Baltimore—which broke recently, causing considerable damage to the machinery, are being replaced by forgings from the works of the Bethlehem Iron Co. at South Bethlehem, Pa. The forgings that broke were not made by the Bethlehem company.

An order for two steel floating elevators, each 150 feet long and 32 feet beam, has been given to John H. Dialogue & Son of Camden, N. J., by the International Grain Elevating Co. of New York. The towers will each have two legs and will be 70 feet high above deck. Each elevator will deliver 14,000 bushels of grain per hour, and have a carrying capacity of 24,000 bushels.

Maris Bros. of Philadelphia, manufacturers of traveling cranes, are putting up a modern and handy machine shop. Running the full length of the building, which will be 55 by 75 feet, will be a 10-ton power crane having a span of 30 feet. On one side will be arranged a gallery for light machinery. The framework is of steel and the covering of the roof and sides will be corrugated iron. The contract for the complete building has been let to the Berlin Iron Bridge Co. of East Berlin, Conn.

Mr. W. D. Kearfott has opened offices in the Wade building, Cleveland, where he will engage in a general engineering business, and as manufacturers' agent for an extensive line of machinery. He has relinquished the office as Ohio manager for Henry R. Worthington, but will continue to make hydraulic and condensing machinery a specialty. Mr. Kearfott will also handle engines, boilers, heaters, rubber goods and a general line of hydraulic and steam specialties. He proposes to look after the engineering features of construction work, and will make estimates and contracts for power plants.

Stone Work for Piers at Superior Entry.

Major Clinton B. Sears, United States engineer at Duluth, opened bids on the 15th inst. for furnishing and placing about 7,000 cords of riprap at the base of piers at Superior entry. There were ten bidders, of whom Jacob H. Carlson of Duluth was the lowest at 71 cents a ton for both derrick rock and small rock. The specifications call for about 29,000 tons of derrick rock and 11,000 tons of small rock. Based on these amounts of rock, the total figures submitted by the several bidders were as follows: Jacob H. Carlson, Duluth, $28,400; McLeod, Campbell & Smith, Duluth, $49,050; Alexander Pearson and A. Frieden, Duluth, $33,200; Frederick Davis, Duluth, $38,179; King & Steele, Duluth, $58,680; Porter Bros., Duluth, $43,570; Frederick J. McKeon, Rush City, Minn., $41,200; Duluth Brownstone Co., Duluth, $30,800; Ashland Brownstone Co., Chicago, $76,550; Heldmaier & Neu, Chicago, $111,770.

Supt. Kimball of the United States life saving service a few days ago purchased a site for a new station at Grand Marais, Mich., on Lake Superior.

Around the Lakes.

Owners of Toledo tugs are engaged in spirited rivalry for business, and are said to be towing vessels from the mouth of the Detroit river to Toledo for practically nothing.

Capt. Charles Swartwood, who has sailed vessels of the Cleveland Rolling Mill Co.'s fleet for a long time past, has been confined to his home in Cleveland for several weeks. His illness is not very serious, but he is slow in recovering.

Capt. Benjamin Hammond, who sailed the lakes in the days of barks, brigs, etc., and who was employed for several years as an inspector with Worthington & Sill, insurance agents of Buffalo, died at his home in Davenport, Ia., recently.

Iron ore shipments out of Ashland up to Sept. 12 were about 25,000 tons in excess of shipments on the same date a year ago. They aggregated 1,285,077 gross tons, of which 617,961 tons were from the Wisconsin Central docks and 667,116 tons from the Northwestern.

J. A. Calbick of Chicago purchased the old lumber steamer Cleveland at marshall's sale, Monday, for $700. At Kenosha, Wis., the steamer I. M. Weston, which has been in several hands lately, was purchased by Norman Baker and Capt. Charles Robertson of Manistee, Mich.

Mr. A. H. Guise, one of Detroit's oldest residents, who is said to have been the first person to portage a large vessel, the Uncle Tom, from Lake Huron to Lake Superior at the "Soo," died at his home in Detroit, Monday. For nearly thirty years past he had been a trusted employe of Hon. Thomas W. Palmer of Detroit.

A gas buoy, painted red and showing a fixed white light, has been placed in 14 feet of water near the southwest extremity of Starve island reef, Lake Erie. It is numbered "4" and replaces the red can buoy No. 4, heretofore maintained in the same position. Bearings are: South end of South Bass island, N. W. ¾ W., 1⅝ miles; east end of Mouse island, S. S. W. ⅝ W., 1⅜ miles; Starve island, N. by W., 1 mile.

Capt. Cornelius Young of Vermillion, O., one of the oldest men in what was known up to this year as the Minch fleet, quit command of the steamer H. A. Tuttle on Monday last. He has been succeeded by Capt. A. E. White, formerly in the Pioneer and other steam vessels. Capt. Young has followed the lakes for about forty years. He is still active and is undecided as to whether he will quit for good or return to the lakes next season.

The fog table recently published on a new pilot chart and in the latest "Notice to Mariners" issued by the hydrographic office, was compiled from data of fifty-five United States fog signal stations on the lakes for seven seasons of navigation. An examination of the table shows that there was a preponderance of fog upon Lake Michigan. The greatest number of hours of fog for the average season of navigation at any of the stations was 641 at Ludington, Lake Michigan. The least number of hours at any station was sixty at Presque Isle, Lake Erie. The average number of foggy days at Cleveland was 139, and is greater than that of any other port on the lakes; but the total number of hours of fog at Cleveland was seventy-seven less than that of Ludington. The hydrographic office does not note, however, in connection with the data regarding Cleveland, that operation of the fog signal is often due to smoke from the city, and not what is ordinarily termed fog.

Ships for the Gold Hunters.

Mr. John Craig, of the Craig Ship Building Co., Toledo, says that the steamer Valley City, which his company sold to the North American Trading & Transportation Co., will be delivered in Alaska during the present week. She was shipped in sections from Toledo on railway cars in five days after the first payment was made on the sale, and her transfer in the northwest to one of the big Pacific ships was equally expeditious. The vessel has an electric light plant that will prove valuable to her Alaska owners in the season of darkness. S. C. Wheeler, manager of the Monk ship yard and marine railway at Sandusky, is another lake builder who is engaged on plans of a Klondike vessel. He proposes to build in sections and transport to the Yukon a sand-sucker or dredger, similar to those in use at Cleveland and other Lake Erie ports. His idea is that the sand richest in gold lies at the bottom of the deepest parts of the river. He would fit the dredge with a separator, as it is his opinion that a craft thus equipped would represent the cheapest method of mining on a large scale in the Yukon region.

Rules for Duluth-Superior Harbor

Rules and regulations for the guidance of vessels using canals and channels in the Duluth-Superior harbor have been issued in accordance with a law giving the secretary of war supervision over such channels. Major Clinton B. Sears, United States engineer at Duluth, is entrusted with enforcement of these rules, and he is anxious that vessel masters should secure copies of them and be fully informed regarding their requirements. In a letter to the Review, which is accompanied by a copy of the regulations, he says:

"I would be much obliged, in the interests of your many maritime readers, if you will call attention to these rules and regulations. It may save some of the vessel men from getting into trouble hereafter, as ignorance of the law is not taken as an excuse for its violation. These rules and regulations will be posted in conspicuous places about the harbor at Duluth, and copies can be had from the superintendents of the two canals, American and Canadian, at Sault Ste. Marie; also from the United States engineer offices at Houghton and Duluth."

The Cramps are about to begin the construction of a steel steam yacht of 179 feet water-line length for Thomas McKean of Philadelphia, and they are said to be figuring with Pacific coast companies for two or three steamers that are to be built during the coming winter.

The Maine Steamship Co. has contracted with the Delaware River Ship Building Co. of Chester, Pa., for a new steamer for its New York-Portland service. She will be 7 feet longer than the John Englis, recently built by the same company, and which is 312 feet over all. She will also have more power than the Englis.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, $1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444.216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered	17,219,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

The one great obstacle which Chicago has to contend with in the proposed extensive improvement of the Chicago river is the lowering of the tunnels. In any lake city other than Chicago there would be no thought of asking for assistance from the general government in a matter of this kind, as improvements within the harbor lines established by the government at all lake cities are designated local improvements, and the war department will have nothing to do with them. Expenses of this kind must be borne by the cities themselves, and in some cases they have amounted to millions of dollars. But through a shrewd move on the part of Chicago shipping interests several years ago control of the river was nominally turned over to the war department, and big appropriations have since been obtained from congress for dredging the inner harbor. Now it is proposed to have the government undertake the task of bringing about a lowering of the tunnels. These tunnels, which connect streets in the heart of the city, would be regarded as local works in any other lake city, and the problem of lowering them would rest with the municipal authorities. But Chicago has the government committed to making local improvements, and it is quite certain that the newspapers of the city are preparing to press the matter with the war department. This is evident from the following editorial paragraph in the Record of that city: "The attention of congress must be directed to the fact that so long as the tunnel crowns remain only 16 feet below the surface it will be simply useless to undertake to deepen the river elsewhere. The argument is unanswerable. The tunnels must be lowered if the river is to be redeemed to the uses of modern-built ships. The only question is as to ways and means of getting these obstructions removed. Congress has complete authority to compel the removal of obstructions to navigation and should be asked to do so. There can be no division of authority in this matter between the nation and the city. But Chicago stands ready to give its help, and what it requires most from the government is such a mandatory power as will enable it to secure the lowering of the tunnels and place the expense where it properly belongs. The three tunnels are used practically exclusively by the street railway companies. They are virtually the property of those companies, and but for the cable lines they would be abandoned entirely. It will be properly the business of the federal government to make a direct demand upon the corporations to pay for lowering the tunnels."

In connection with other valuable scientific work recently begun on the lakes, the hydrographic office, navy department, might well undertake the task of collecting such information as may be secured regarding waves —their height, force, etc. As far as we can learn no information on this subject pertaining to the lakes has ever been published, although there are numerous calls for it. Vessel masters would undoubtedly lend assistance in work of this kind, as in other investigations undertaken by the hydrographic office, but it would seem that some influence should be found in Washington to prevent the duplication of scientific work in different departments. We have the weather bureau and the hydrographic office going over the same ground on the lakes just now in the matter of fog charts. The vessel master who is willing, in the interest of science and the general welfare, to act as an observer for one branch of the government service may tire of his efforts if he is asked to give up valuable time in a duplication of work. Then, too, he is disappointed when one of these departments undertakes a certain line of inquiry and is compelled to drop it as soon as a new secretary comes into office. A few years ago the weather bureau issued a wreck chart, giving location of wrecks, number of lives lost, value of property lost, etc. This chart was to be published at stated intervals, but when Secretary Morton came into office he shut it off without even giving a reason for its discontinuance. It was of no particular value except as a reference map, but men of business who give up their time to furnishing information for such publications are annoyed when they find that in some cases the only excuse for work of this kind is to give subordinates in the government service an opportunity to pretend to their chiefs that they are doing great things.

One important feature of the work undertaken by the commission of engineers now engaged on surveys for a ship-canal from the lakes to tidewater is that pertaining to the volume of water discharged through Niagara river. The commission will evidently collect important information on the subject of regulating the level of Lake Erie by means of a dam above Niagara, as one of its first acts was to secure from Col. G. J. Lydecker, United State engineer at Detroit, the services of Mr. E. E. Haskell, an assistant engineer in the government service, who will spend the next two months in determining the Niagara outflow. Mr. Haskell is an expert in work of this kind. In explanation of the action of the commission in this regard, Mr. Geo. Y. Wisner, one of the members, says: "The Niagara river outflow has twice been determined with such widely different results that it is obvious that one conclusion, perhaps both, is wrong. Mr. Haskell's determination will settle the matter. It is an extremely important work. Structures to regulate one volume of water would be entirely inadequate for a much larger flow. I am convinced that the regulation of lake levels is feasible, and that equilibrium at a point below the maximum elevation can be maintained."

Brassey's Naval Annual for 1897, an authority on naval matters, shows that England puts down a navy as efficient as ours every two years, completing it in that period. The annual opens with this sentence: "The British navy estimates for 1896-7 amounted to £21,823,000, as compared with £18,701,000 for 1895-6, or an increase of over three millions sterling ($15,000,000). The increase was generally approved by the country at large." This $15,000,000 will practically duplicate the fighting ships of the United States navy. Five battleships of the Canopus class, larger and swifter than our Alabama class, were laid down and will be finished a year before ours. Four new first-class cruisers were begun, to answer our four. Nine second-class and eight third-class complete the analogy. The number of torpedo boat destroyers was increased to ninety. We have half a dozen. The annual also states that in the coming year—1897-98—the British admiralty proposes to begin the construction of four battleships, three third-class cruisers, two sloops, four twin-screw gunboats and two torpedo boat destroyers.

Articles have been filed in New York state for the incorporation of the Florida-Trans-Peninsular Ship-Canal Co., with a capital of $75,000,000. The incorporators are Robert M. Caffall, Freeman H. Baldwin, H. B. Peraza, consul-general for the Great Republic of Central America; Benjamin E. Cromwell and Francis P. Fleming. The object of the projectors of the company is the construction of a ship-canal and railway to connect the Atlantic with the Gulf, the canal to be of sufficient capacity to allow of the passage of all seagoing vessels. Apart from being of great advantage to this country for defensive purposes in time of war, the greatest commercial benefits are claimed for the new project, which it is said will shorten the time for vessels going to Texas and Mexico at least three days. Mr. Caffall, the civil engineer for the work, is reported to have already surveyed the ground and completed arrangements for beginning the construction of the new waterway. The harbor of St. Augustine, Fla., has been settled on for the eastern entrance of the canal.

The fifth volume of the series entitled "Official Records of the Union and Confederate Navies in the War of the Rebellion," issued by authority of congress and published by the superintendent of naval war records, is at hand. The Review has several times called attention to this valuable work. The fifth volume covers the operations on the Potomac and Rappahannock rivers from Dec. 7, 1861, to July 31, 1865, and of the Atlantic blockading squadron from April 4 to July 15, 1861. The illustrations are again a special feature. In this volume are pictures of the United States ships Portsmouth, Jacob Bell, Fuschia, Minnesota, Quaker City and Harriet Lane. It contains also a sketch of Fort Lowry, Va., a drawing of a Confederate torpedo, and the great seal of the Confederate states.

Naval officials have made up their minds on the question of dry docks. Washington advices say the next report of the secretary will recommend that dry docks be authorized at Boston, League Island, Norfolk and Mare Island, and that appropriations for the work will be urged upon congress during the next session. The Halifax incident will go a great way towards assisting the department in securing appropriations for these docks.

Reports regarding business of the telegraph companies are an indication of returning prosperity. It was stated at the headquarters of the Western Union and Postal companies in Chicago a few days ago that both companies have for several weeks past exceeded all previous records in the amount of business handled. Men are worked overtime and there is considerable difficulty in securing the number of good operators that is needed.

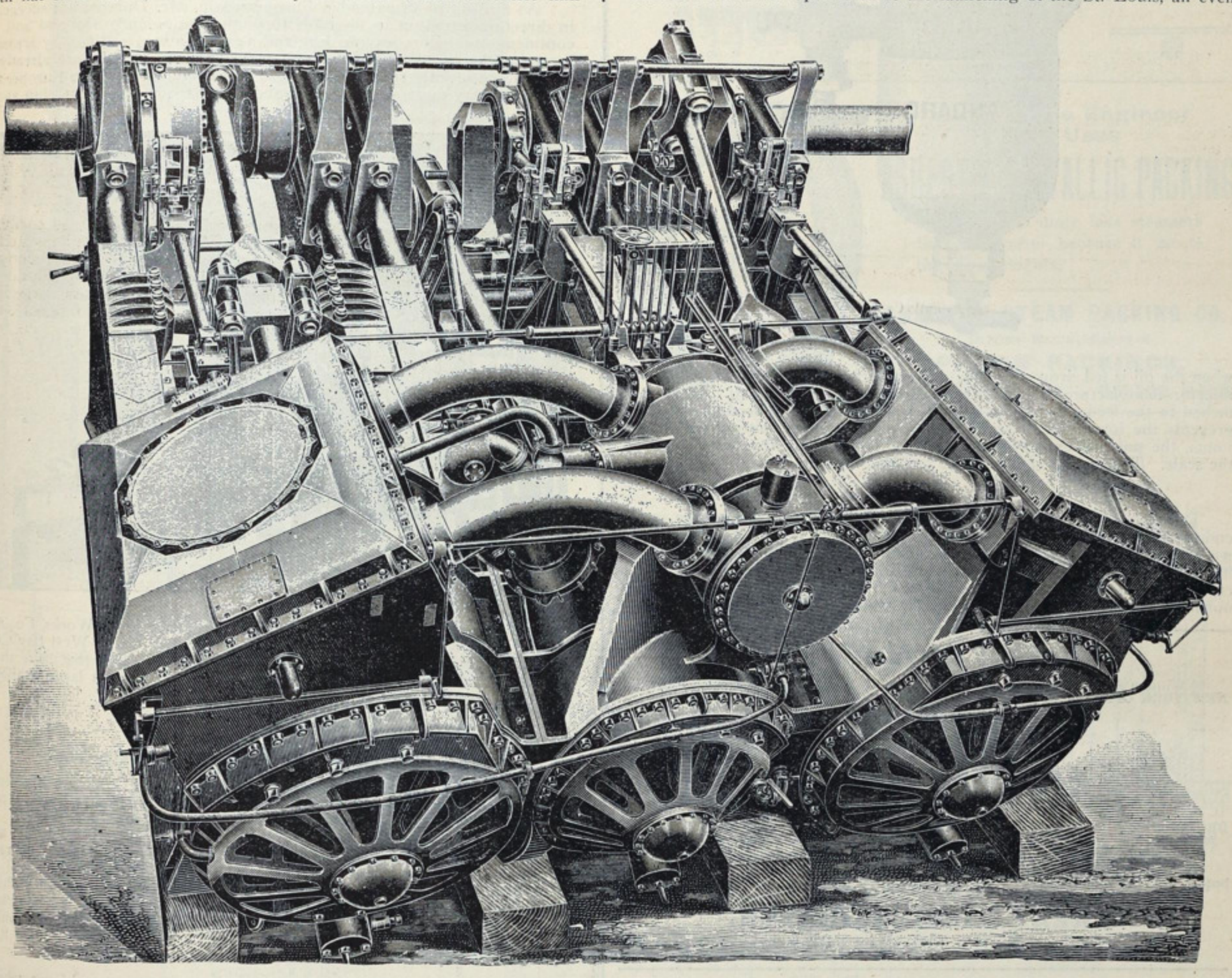
The 100th anniversary of the launching of the frigate Constitution will be observed in Boston on Oct. 17. "Old Ironsides" will be towed from Portsmouth, N. H., to Boston about Oct. 10.

Home-seekers' excursions west, northwest and southwest are offered via the Nickel Plate road Sept. 21 and Oct. 5 and 19, at about one fare for the round trip. Inquire of agents. 316-Oct. 18

Most Powerful Paddle Steamer in the World.

A side-wheel steamer of 10,000 horse power, capable of maintaining a speed of 25 statute miles an hour, is certainly a wonderful vessel of her kind. Such a ship was recently completed by the Fairfield Ship Building & Engineering Co. of Govan, Scotland, for the Isle of Man Steam Packet Co. and is now in service between Liverpool and the Isle of Man. The Empress Queen, as she is called, is of the following dimensions: Length, 360 feet; over all, 375 feet; breadth, 42.3 feet; breadth across paddle boxes, 83.5 feet; depth, 17 feet; moulded depth to spar deck, 25.5 feet. She is designed for an excursion trade involving a run of about four hours, and has four decks, one of which, the promenade deck, is unobstructed for 210 feet of its length.

The illustration of engines of this steamer, printed herewith, is from the Engineer of London. They are of the compound diagonal surface condensing type, with three cylinders, viz., a high pressure cylinder in the middle and a low pressure cylinder on each side of it. The high pressure cylinder is 68 inches in diameter, and each of the low pressure cylinders is 92 inches in diameter, the length of stroke being 84 inches. The high pressure cylinder is fitted with a piston valve, and the low pressure cylinders with flat slide valves, all controlled by the usual double eccentric link motion valve gear. The starting and reversing of the engines is effected by a large steam and hydraulic engine on the direct-acting principle. The crank shaft, a ponderous piece of machinery, is built up, and, together with the paddle shafts, is forged of mild steel and bored hollow. The paddle wheels are of large dimensions, each having three sets of arms. The wheels are of steel, and constructed on the feathering principle, with curved steel floats. Placed athwartships, between the cylinders and the supports for the shafting, is the condenser, which is of cylindrical form, the condensing water being supplied by a separate centrifugal circulating pump worked by an independent steam engine, which pump is also arranged so as to clear the bilges of water in case of a serious leak. The feed pumps, two in number, are also independent of the main engines, and are each capable of supplying the boilers with water when working at full power. Steam is supplied from four double-ended boilers, arranged in two compartments, one forward and one aft of the engine room, with two funnels. The boilers are of the multitubular return tube marine type, having eight corrugated furnaces in each, and constructed entirely of steel, to stand a working pressure of 140 pounds per square inch. They are adapted to work with the Howden system of hot draft. The lagging casing was not in place on the cylinder covers when the engines were photographed, and the peculiar appearance of the high-pressure cylinder cover is due to the foreshortening brought about by the position of the camera.



Engines of Paddle Steamer Empress Queen.

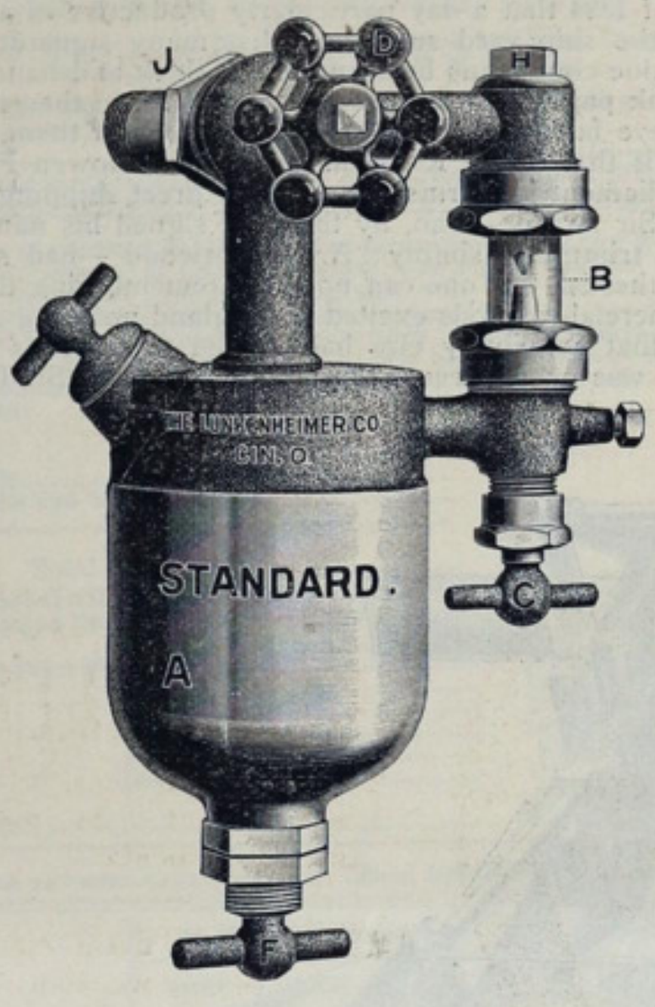
"Visitors' Book" at the Cramp Ship Yard.

In few places is there a "visitors' book" containing more names of really prominent people than those recorded in the volume kept at the Cramp ship yard. The famous Philadelphia yard is a place to which almost everybody of note in this country is sure to go sooner or later, and distinguished travelers from abroad are often found there in great numbers. Unfortunately, this book is less than three years old, for it was not until the fall of 1894 that a day particularly productive of applications for admission to the ship yard suggested that many signatures of intrinsic interest and value could thus be secured. A thick and handsomely bound volume of blank pages was at once prepared. Since then names more or less famous have fairly rained upon it. The first of them, under date of Oct. 18, 1894, is that of the Rt. Hon. Sir Arthus Bowen Forwood, Bart., member of parliament for Ormskirk. As the great shipping man of Liverpool, perhaps Sir Arthur—who, by the way, signed his name without any frills or other trimming, simply "A. B. Forwood"—had something of a claim to head the list, but one can not help remembering the savage criticism his commercial methods excited in England not long ago, and therefore wishing that somebody else had signed first. Less than a month after the book was opened came the launching of the St. Louis, an event that attracted eminent guests by the score, and then a big addition to the the record was made. It included the names of President Cleveland and his wife, and dozens of the cabinet officials, army and navy officers, senators and representatives, and foreign diplomats. In the following year Naokai Miyaoko, commander of the imperial Japanese navy, added his signature to the collection, and there were others from every part of the globe, representing professions as diverse as cricket-playing and colonial bishoping. Chinese names are fairly frequent on the list, and in most cases the hieroglyphic is followed by its English equivalent, handsomely written out by the obliging notability or his interpreter. Chang Yen Hoon, who represented the Emperor of China at the jubilee ceremonies in London, was at the yard recently, and was not allowed to depart without adding his highly decorative mark to the collection, but a few lions manage to do so, and then there is trouble for the man in charge of the book.—New York Times.

Luce's "Seamanship" has been a text-book at the United States naval academy for the past thirty years. It is being used by naval reserve organizations all over the country. It is a standard work, selling at $10, and will be mailed to any address at that figure by the Marine Review, 409 Perry-Payne building, Cleveland.

Standard Oil Injector.

Thirty per cent. more fuel is required to heat a boiler with ⅛ inch scale than if it were clean. This is well known among engineers, and consequently there is a large sale of water purifiers. The action of oil on the most troublesome scale is also well known, but when oil has been used without great care, blisters have resulted. This is not the case, however,



when the oil is fed drop at a time. The illustration herewith shows an oil injector manufactured by the Lunkenheimer Co., Cincinnati. When attached to the feed water pipe, and Emerald boiler oil is used, it not only prevents the formation of scale, but prevents foaming, pitting and leaky joints, the unequal expansion causing the latter being due very often to the scale. The quart sizes complete are $15.

Draft of water in shallow parts of the Detroit river during the week ended on Saturday last was as follows: Sept. 12, 17 feet 8 inches, with wind south, light; Sept. 13, 18 feet 3 inches, north-east, light; Sept. 14, 17 feet 11 inches, north-east, light; Sept. 15, 18 feet 2 inches, south-east, moderate; Sept. 16, 17 feet 11 inches, south-east, light; Sept. 17, 17 feet 9 inches, north, moderate; Sept. 18, 17 feet 2 inches, southwest, strong.

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Newport News Shipbuilding & Dry Dock COMPANY.

WORKS AT NEWPORT NEWS, VA.
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Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

SHIP AND ENGINE BUILDERS.

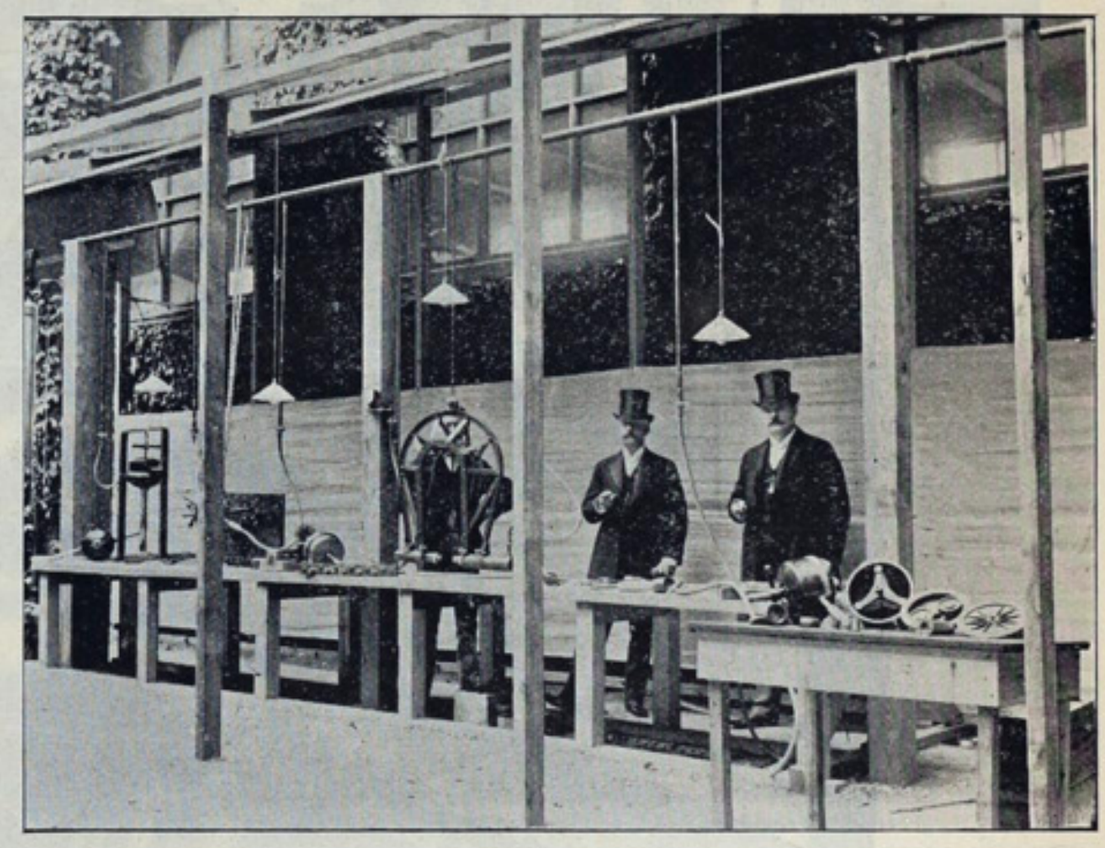
For estimates and further particulars, address

C. B. ORCUTT, Pres't,
No. 1 Broadway, New York.

Success of Pneumatic Tools.

American machinery of all kinds is gradually finding its way into European manufactories, but few concerns in this country have been as successful as the Chicago Pneumatic Tool Co. in introducing labor-saving devices to foreign markets. When the American delegates to the International Congress of Naval Architects and Marine Engineers met at the Imperial Institute in London to take part in the discussion of technical papers, they found that J. W. Duntley, president of the Chicago company, had preceded them, and right on the ground he had a display of pneumatic hammers, drills, etc., all in working order. The tools were there to be tried by the ship builders, and they were invited to drive a rivet or run a chipping tool through a slab of steel with apparently as much ease as would be found in forcing a sharp chisel through a piece of pine. This is, of course, stretching the matter a little, but it was evident that a tool of this kind would do its work at about one-fourth the cost of hand labor. Immediately upon examining the machines the Russian naval attache at London ordered a full set of them for his government, and they were under trial constantly throughout the congress. The London exhibit of the Chicago company, with Mr. Duntley and Mr. W. I. Babcock standing near, is illustrated in the accompanying engraving.

As a result of an extended European trip, Mr. Duntley has succeeded in directing attention to his tools throughout England, Scotland and the continent, and before leaving England he made a very satisfactory arrangement for the manufacture of them in that country. They are already in use in some seventy railway shops and ship building plants in Europe, and in this country there are over six hundred railroads, foundries, ship yards,



and boiler shops that are using them. The Globe Iron Works Co. and Variety Iron Works of Cleveland, F. W. Wheeler & Co. of West Bay City, and the Detroit Dry Dock Co. are among lake concerns that have these tools in operation. They have also been sold recently in large numbers to the Cramps and to the Newport News company.

Low Rate Excursion to Chicago.

On Oct. 8 a special train excursion will be run to Chicago with return limit of tickets good for five days. Tickets will be sold at Cleveland and all stations west at rates lower than have been offered for several years.

Oct. 9 will be the 26th anniversary of the memorable Chicago fire, and the event will be celebrated on Oct. 9, 1897, as only Chicago can celebrate.

In addition to the special train, the cheap excursion tickets will be good within the five days on any one of that trio of express trains which are doing so much to increase the popularity of the favorite Nickel Plate road. Watch the papers for further information on this subject and confer with ticket agents. Oct. 8.

Bermuda is the name of the wooden steamer, Welland canal size, which was launched at the ship yard of James Davidson, West Bay City, on Saturday last. She is 240 by 41 by 20 feet, and will have compound engines with cylinders of 21 and 42 inches by 30 inches stroke. Steam will be furnished by a Scotch boiler 12 by 12 feet.

The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

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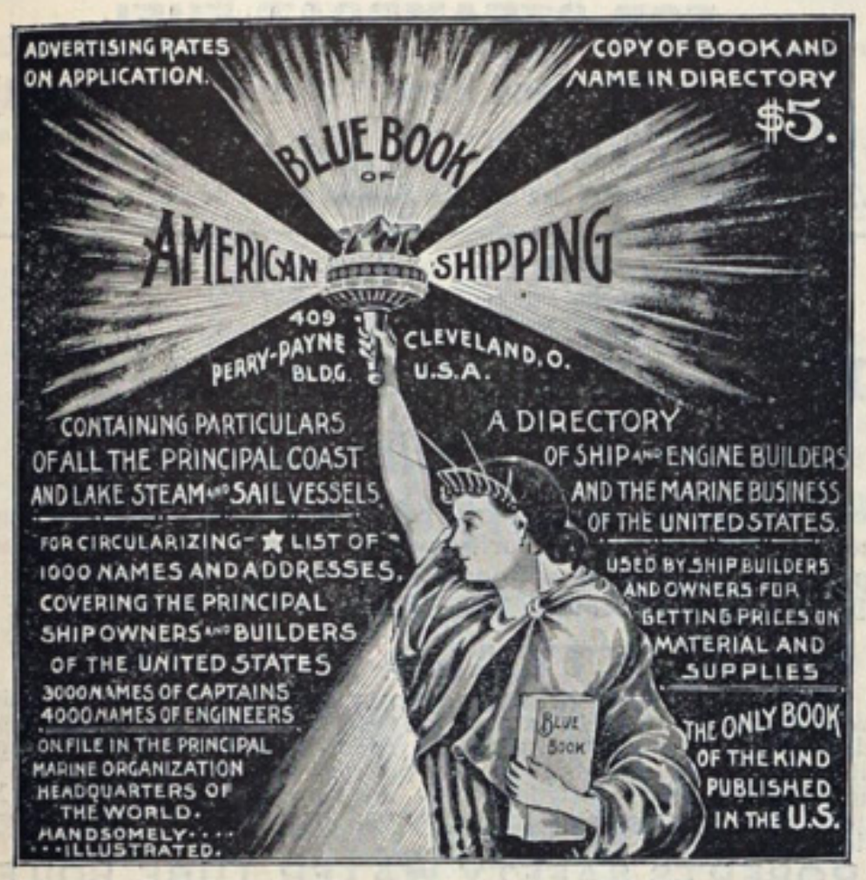
MACHINIST AND ENGINEER of many years experience as 1st Asst. and Chief Engineer of Ocean Steamers, wishes to invest money and services in Engine building or repair Shop. Address Engineer, Care MARINE REVIEW, Cleveland, O.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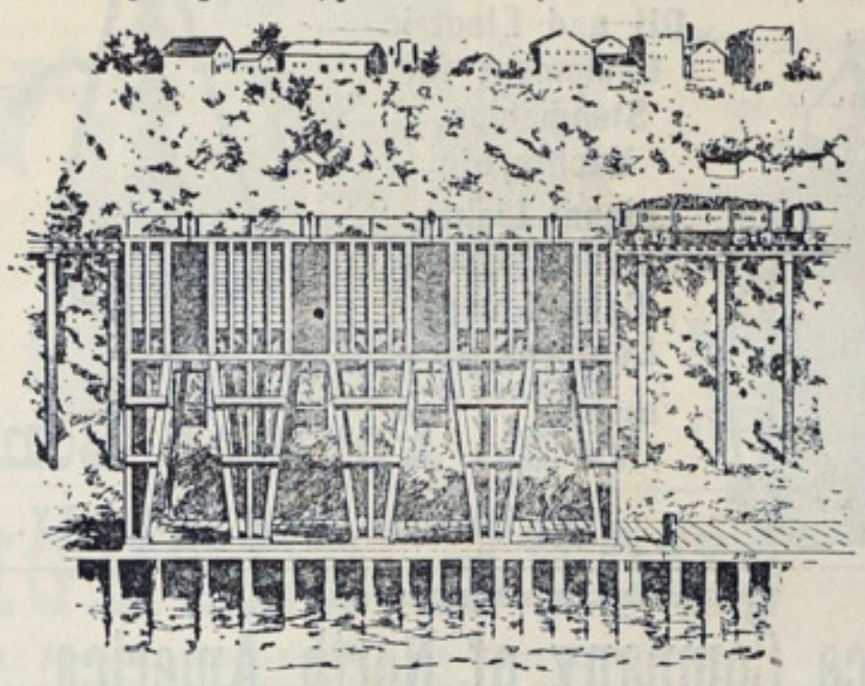

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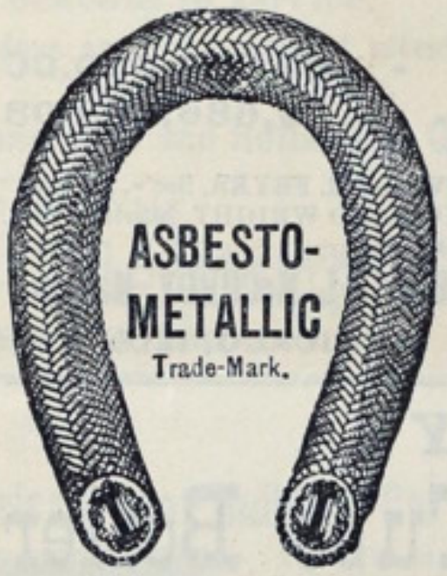

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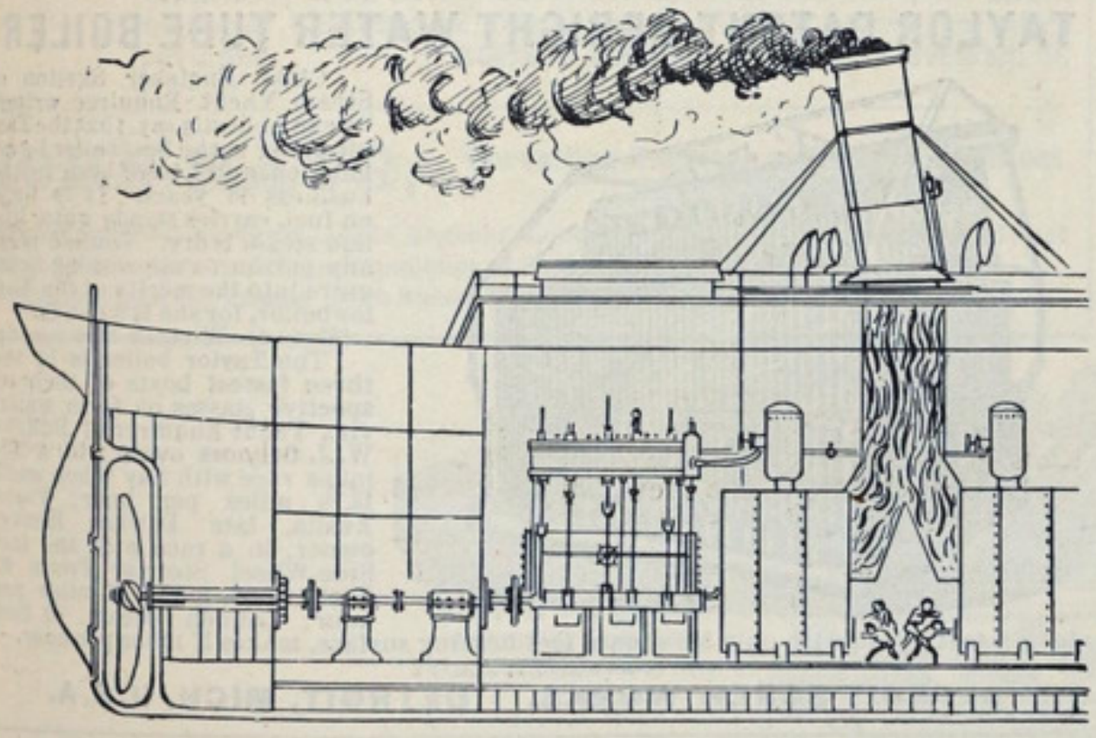
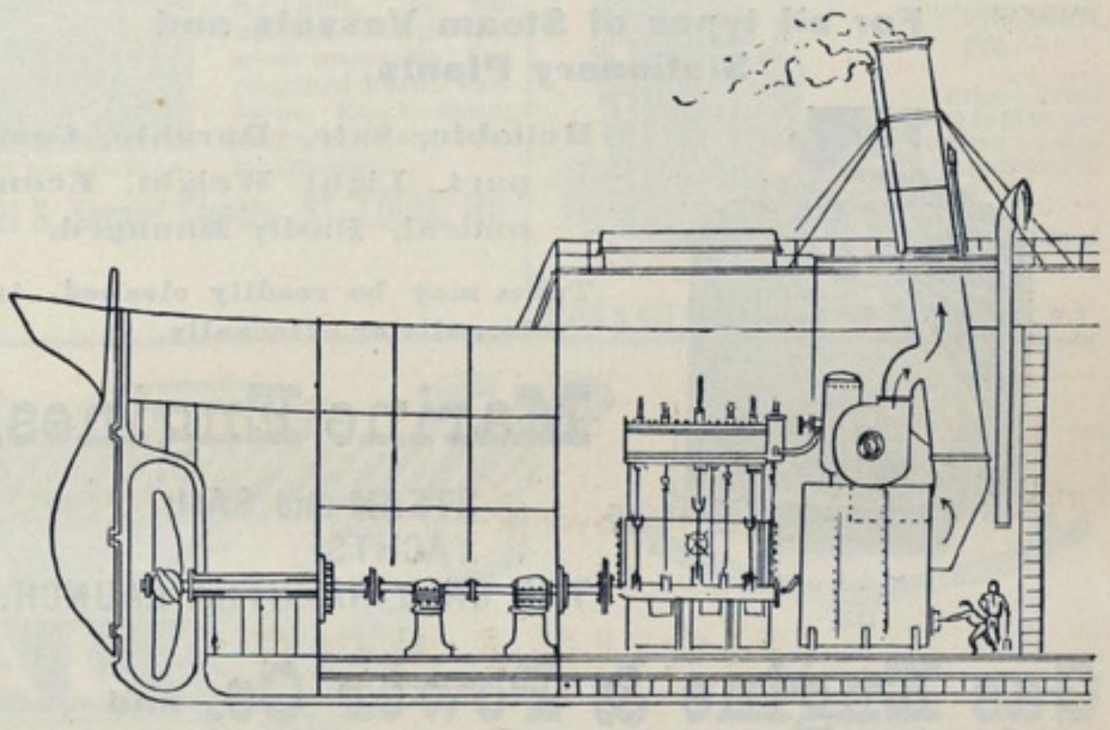


Natural Draft.—Recommended to Owners who Have Money to Burn.



Ellis & Eaves Induced Draft and Serve Tubes—Guaranteed to Save 25% in Fuel.

TRIP SHEET.....OF STEAMER.....MASTER.....
From LORAIN, OHIO, August 2, 1896, From TWO HARBORS, WIS.....1896,
To SUPERIOR, WIS.....1896. To CLEVELAND, OHIO, August 13, 1896.

Corresponding Amounts, Provided this Steamer had been Equipped with Ellis & Eaves Draft and Serve Ribbed Tubes.

									% Saving.
ENGINEER'S DEPT.									
Fuel, 165 tons	$348	62			$261	46			25
Oils	15	14			15	14			
Repairs	1	00			1	00			
Supplies	11	66	$376	41	11	66			
STEWARD'S DEPT.							289	26	
Provisions	119	20							
Supplies	3	37	122	57			122	57	
Handling Cargoes (unloading)	364	40							
Hull Repairs	20	25							
Towing	12	00							
Chandlery	1	38							
Sundry	13	15	411	18			411	18	
WAGES—ELEVEN DAYS.									
Captain, $175.00 per mo	64	16			64	16			
Mate, 80.00	29	33			29	33			
2d Mate, 56.00	20	54			20	54			
2 Wheelmen, 34.00 (12.46)	24	92			24	92			
2 Lookouts, 34.00 (12.46)	24	92			24	92			
1st Engineer, 112.50	41	25			41	25			
2d Engineer, 80.00	29	33			29	33			
2 Greasers, 34.00 (12.46)	24	92			24	92			
3 FIREMEN, 34.00 (12.46)	37	38			37	38			33⅓
4 Deck-hands, 17 00 (6.23)	24	92			24	92			
1st Cook, 60.00	22	00			22	00			
2d Cook, 17.00	6	23	349	90	6	23	349	90	
Total Expenditures			1260	06			1172	91	

Up Cargo, 2453 (1900) net tons.
Down " 2265 gross "

Net saving each trip, $87.15.

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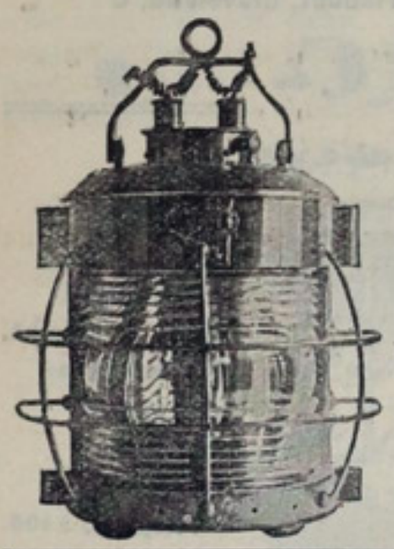

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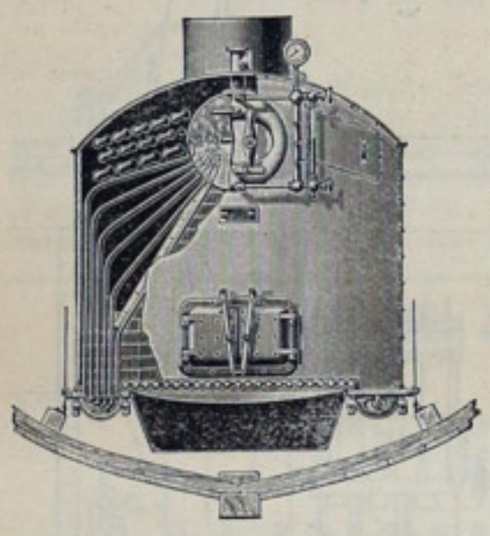

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Tubes may be readily cleaned, internally or externally.

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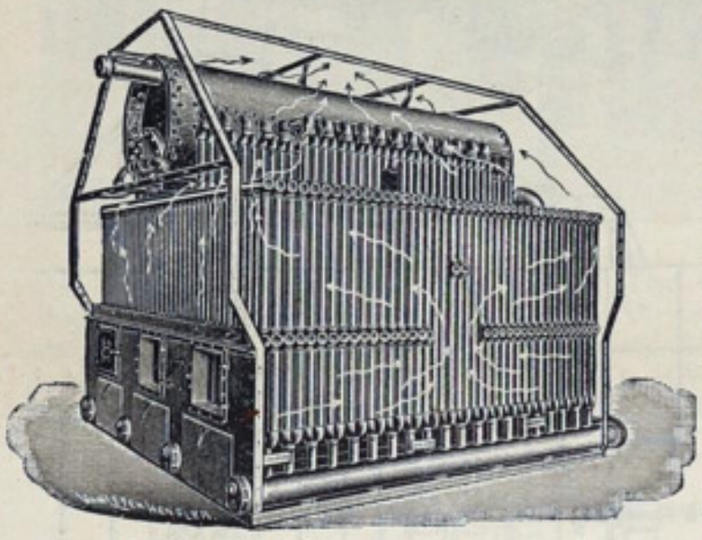

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(Signed) WILLIAM SKELTON, Jr.

The Taylor boiler is in the three fastest boats of their respective classes on fresh water, viz., Yacht Enquirer of Buffalo. W. J. Connors owner; in a 29½ miles race with Say When made 18.78 miles per hour; Yacht Azalia, late Edward Henkel owner, in a race with the fast Side-Wheel Steamer Frank E. Kirby, 1896, made 18 miles per hour; Launch Dream, 63 feet long, 9 feet beam, with only 350 square feet heating surface, makes 17 miles per hour.

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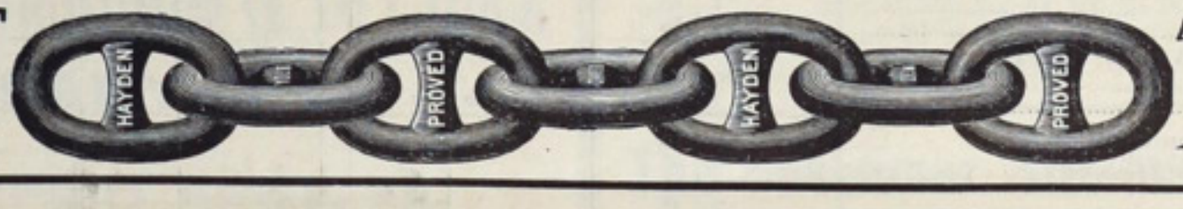

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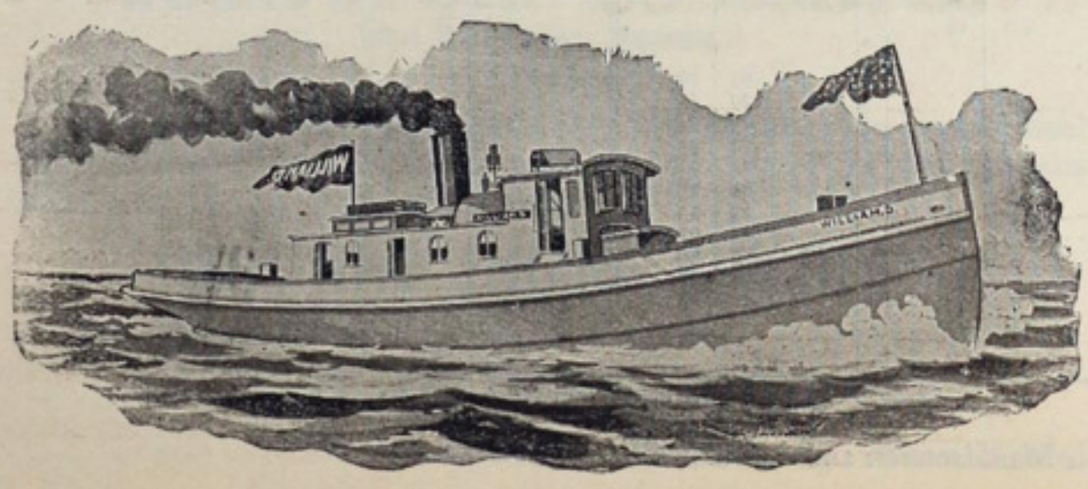

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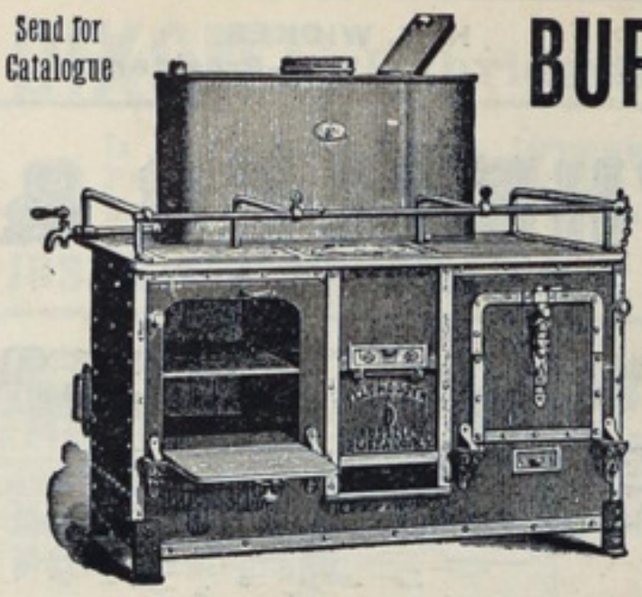

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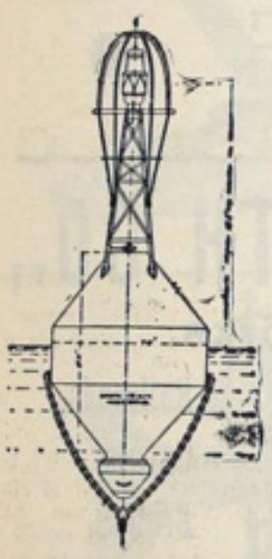

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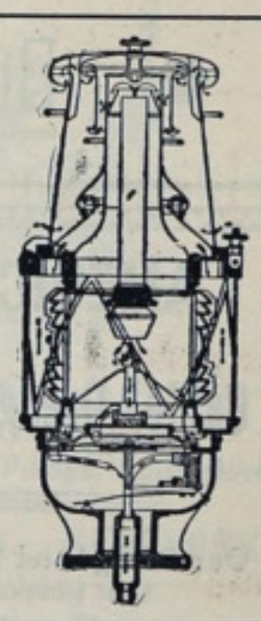

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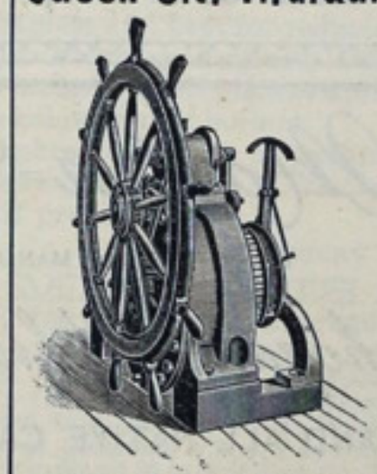

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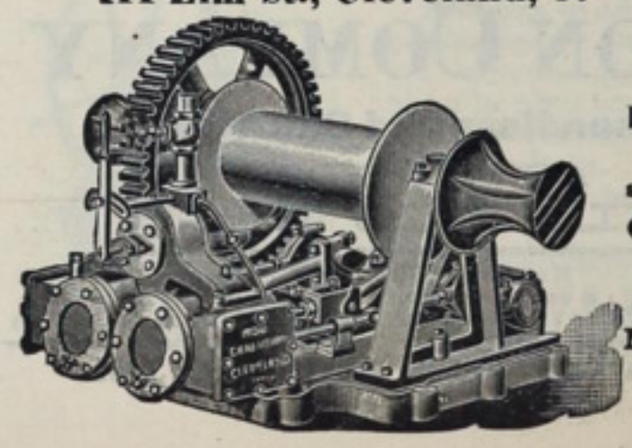

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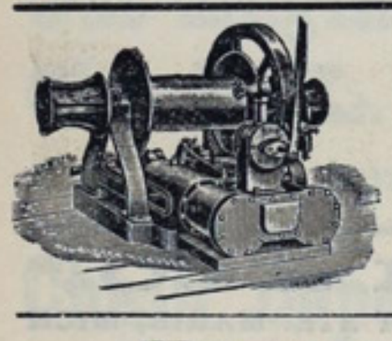

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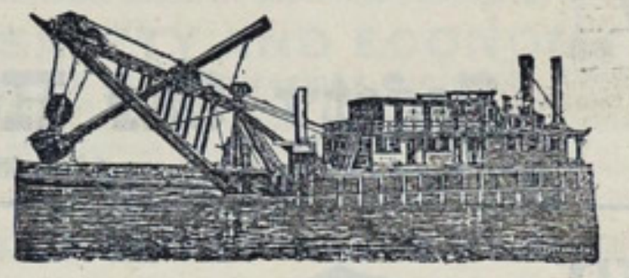

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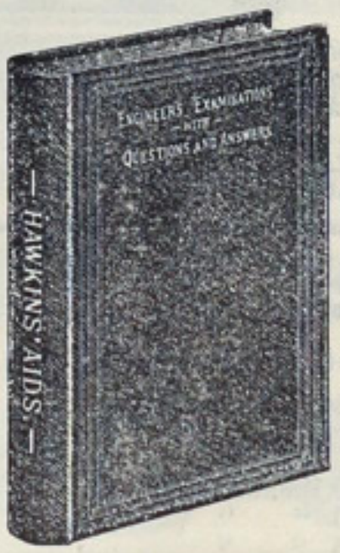

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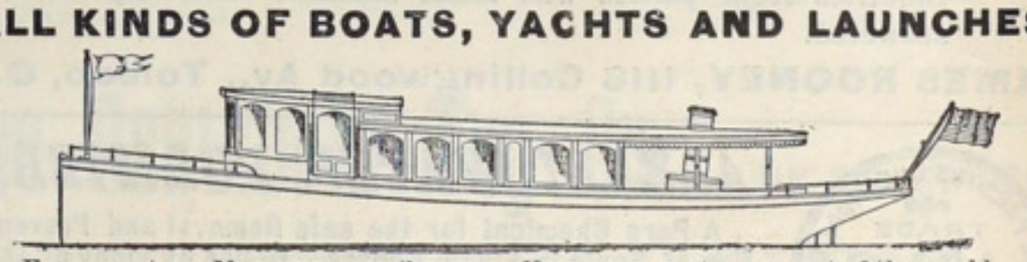

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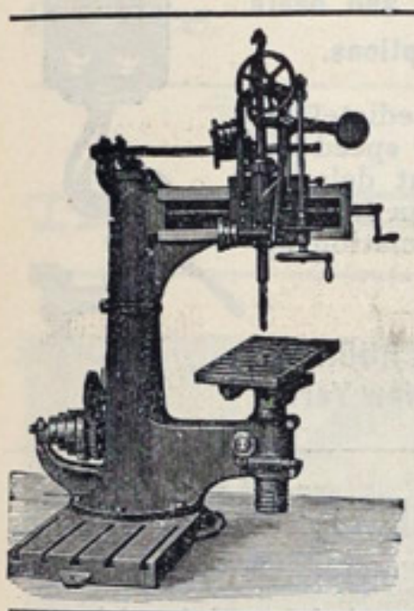

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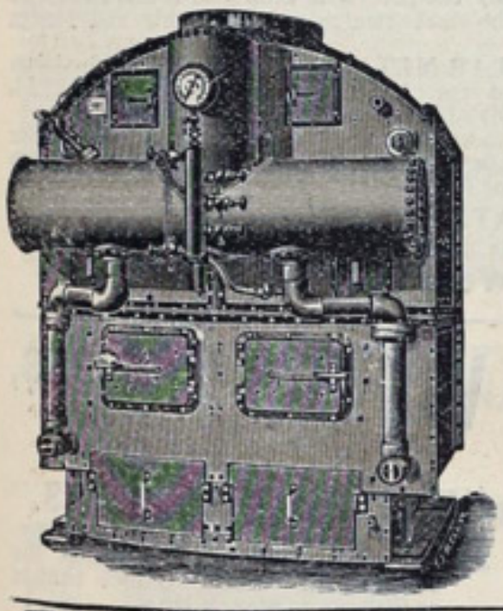

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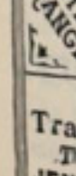

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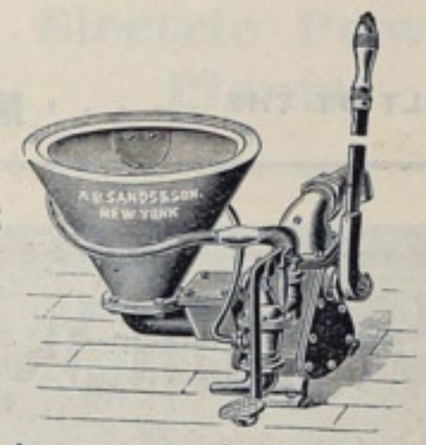

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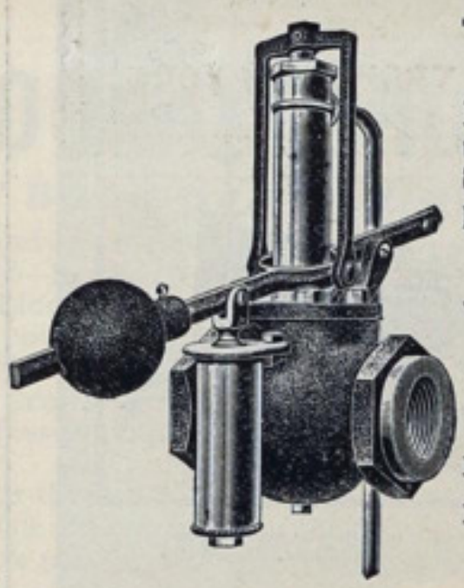

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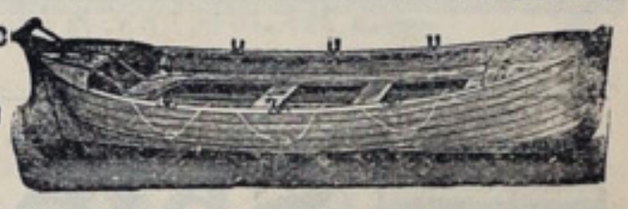

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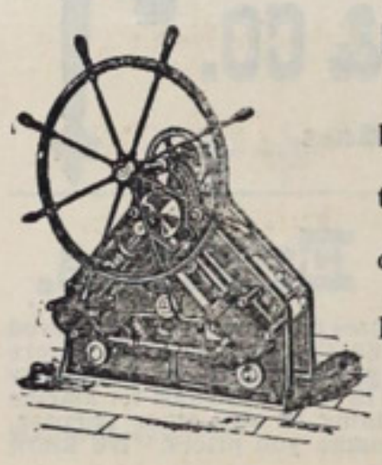

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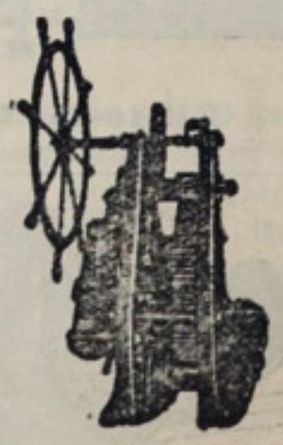

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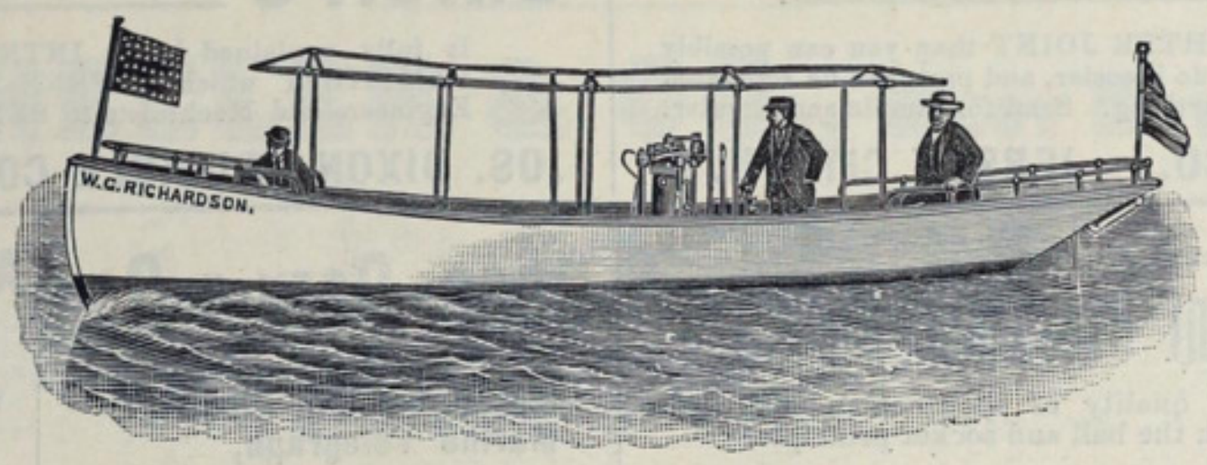

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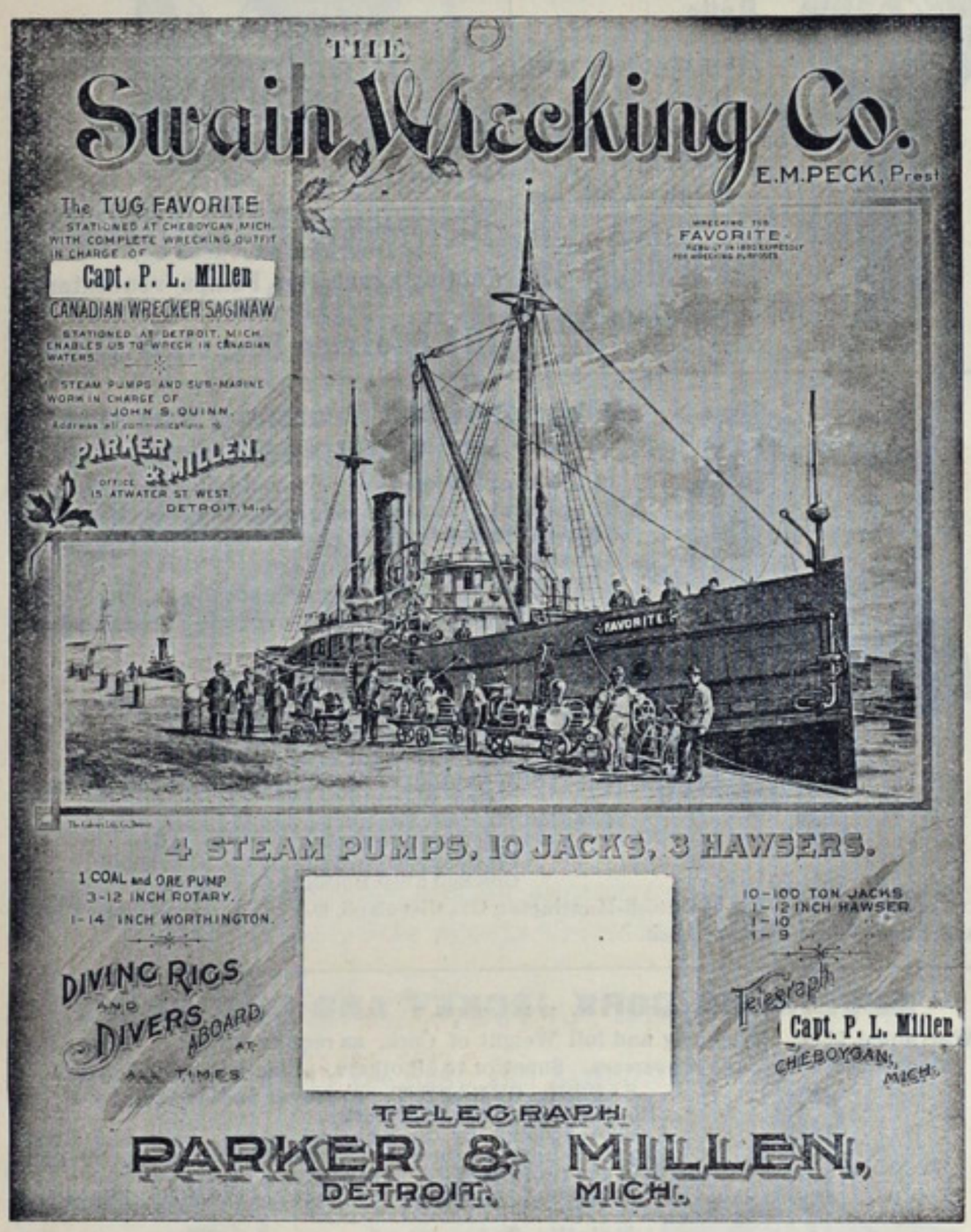

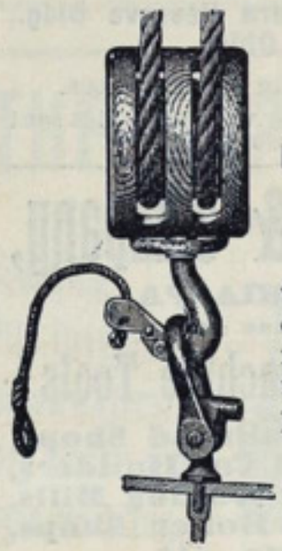

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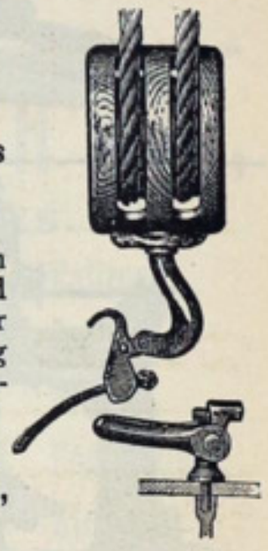

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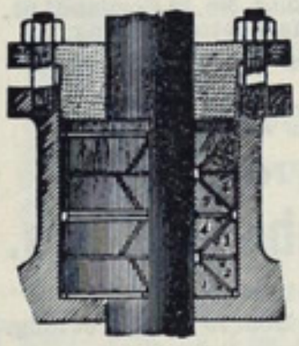

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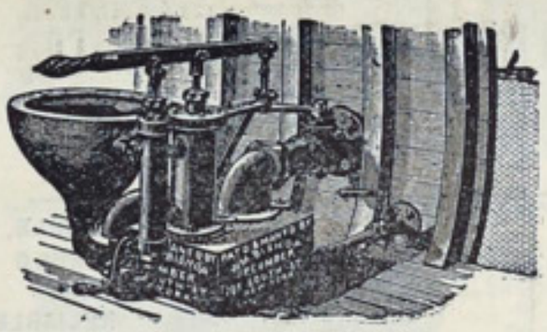

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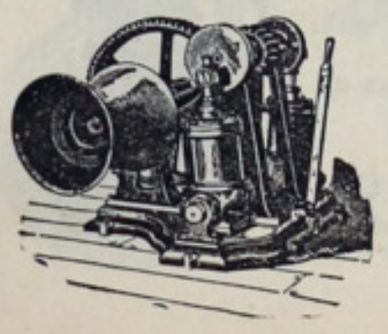

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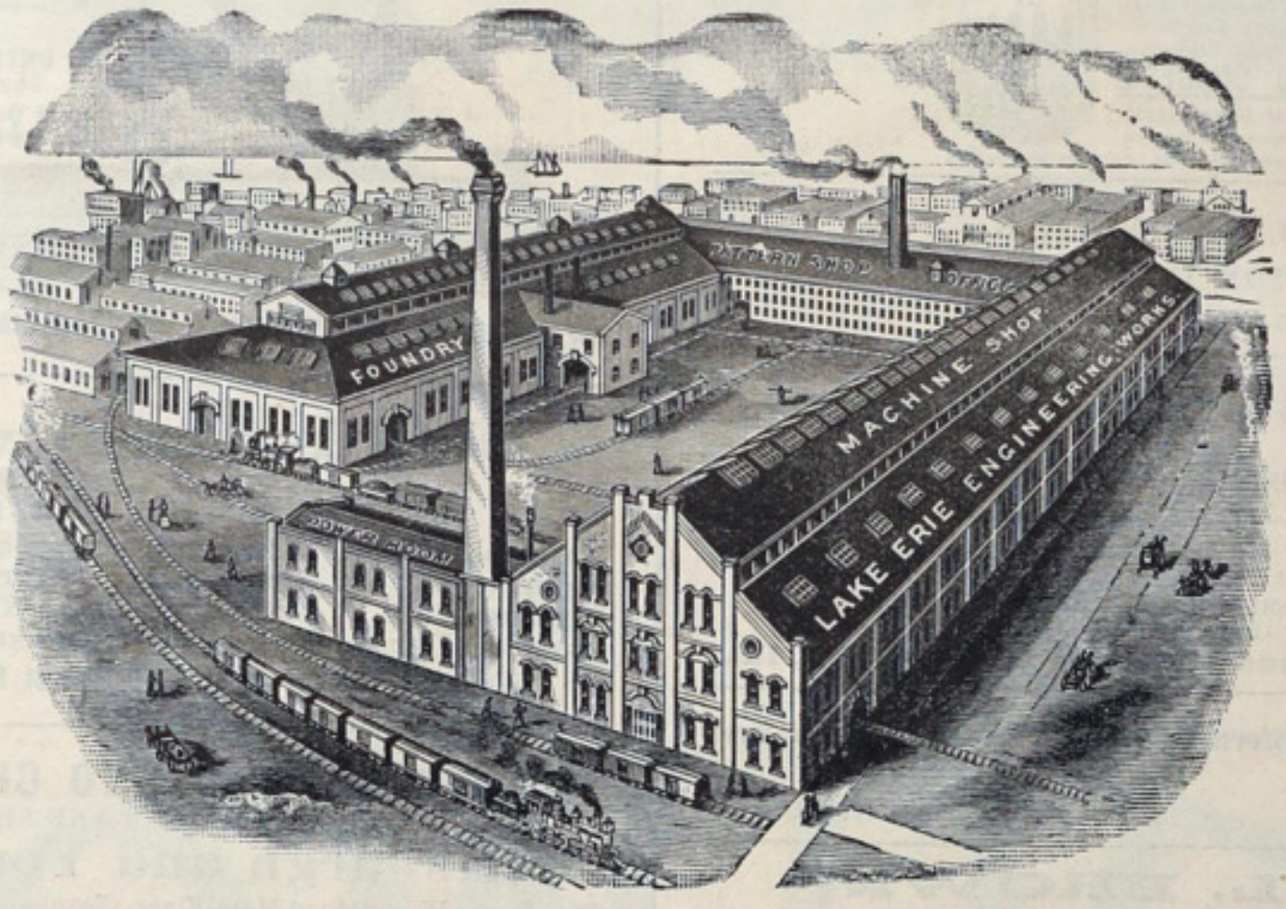

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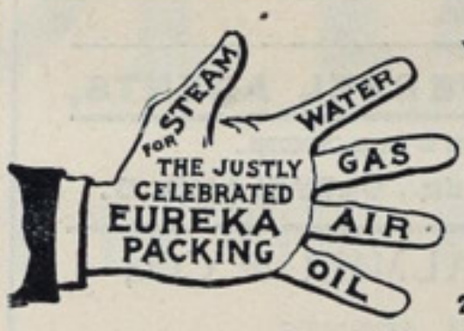

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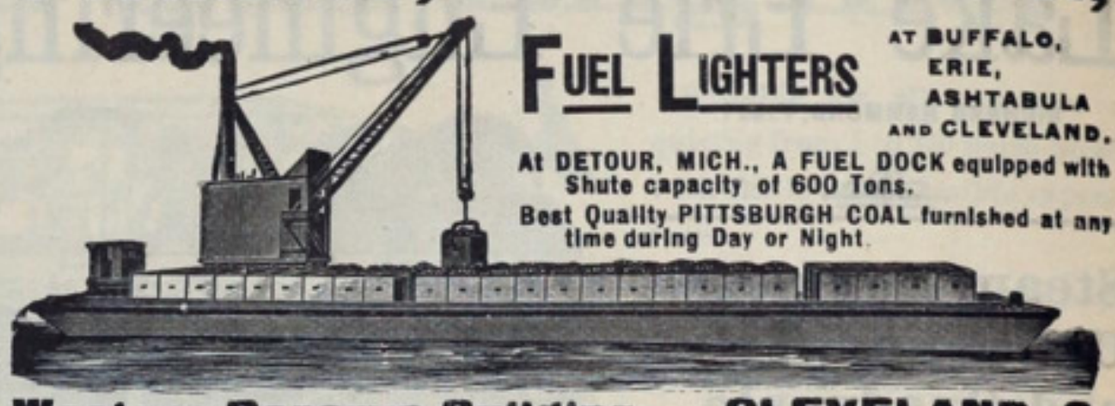

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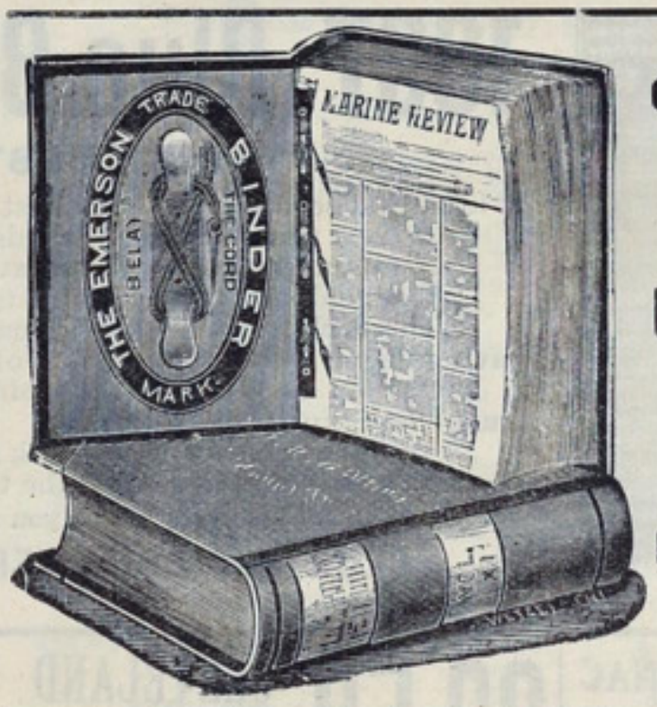

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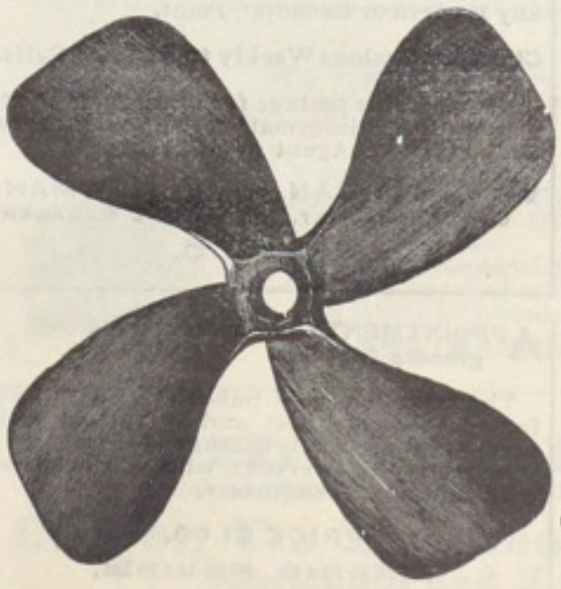

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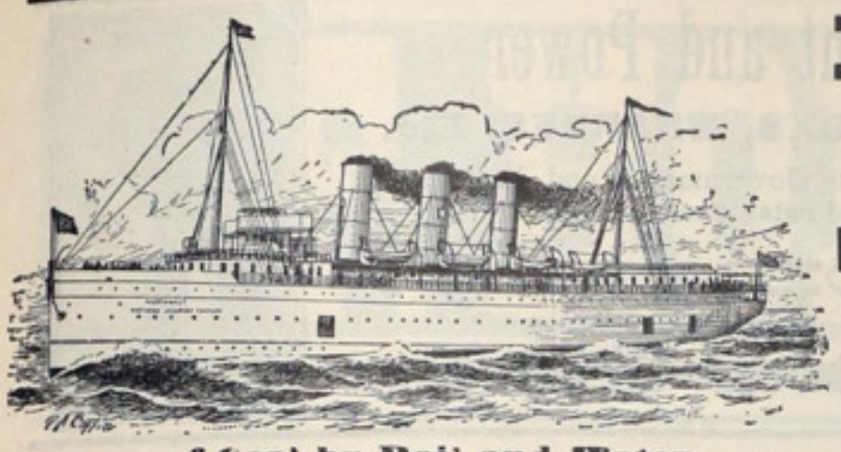

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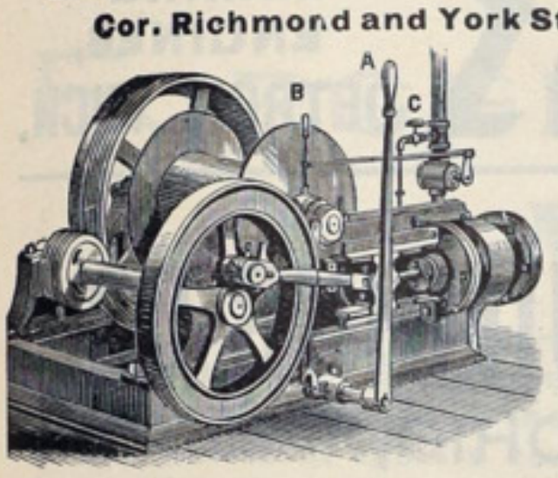

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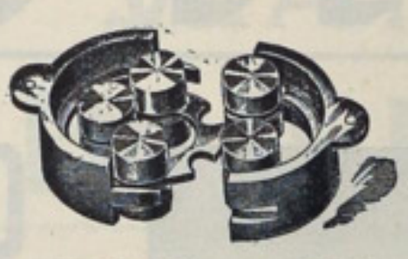

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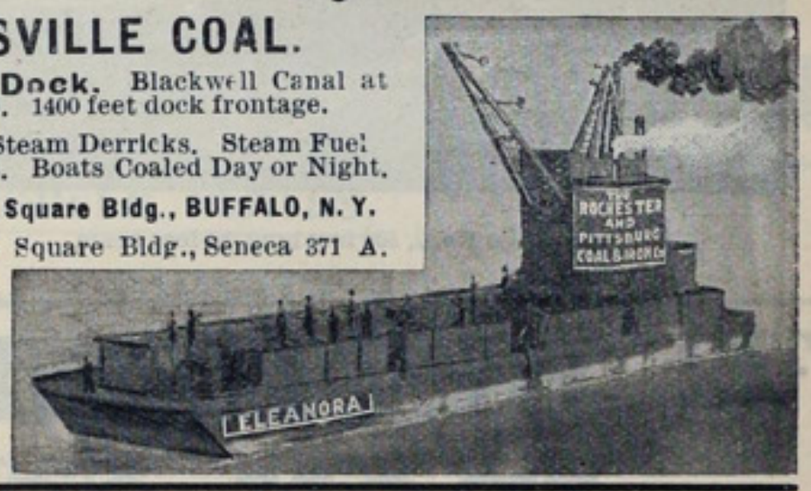

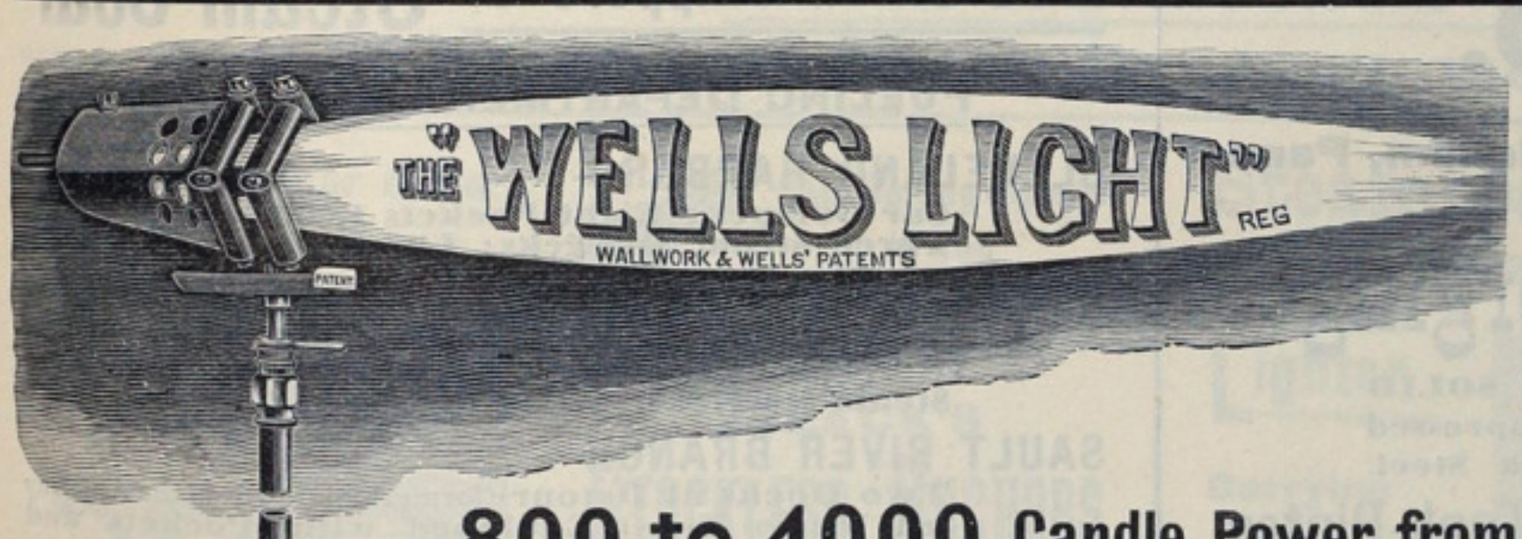

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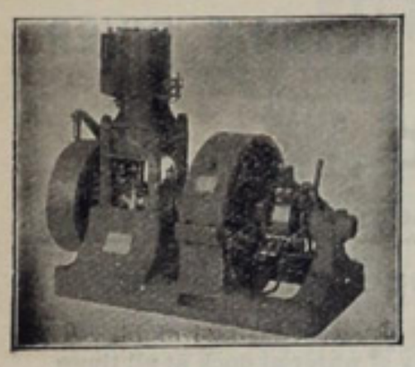

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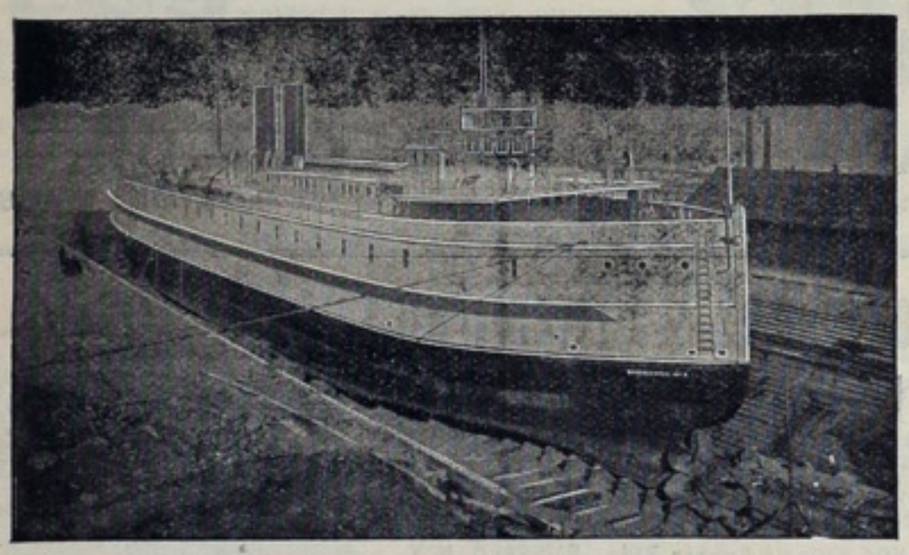

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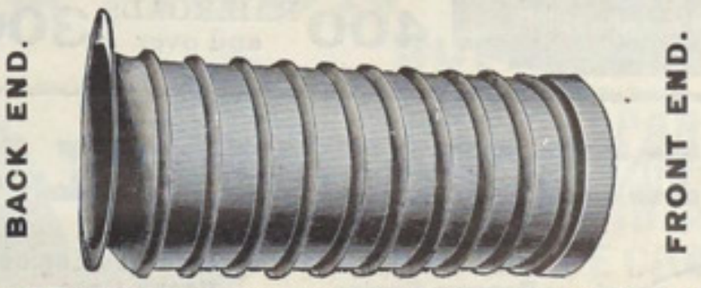

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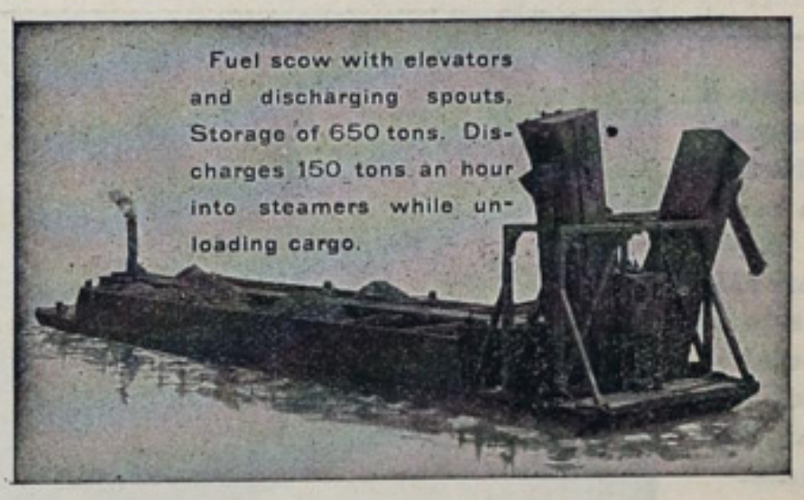
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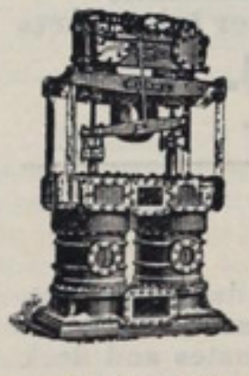

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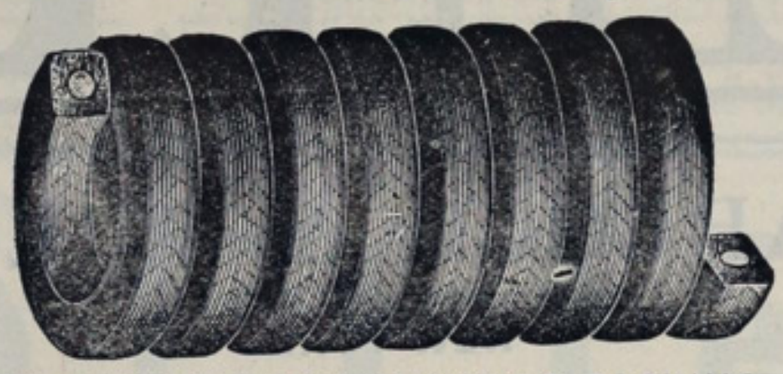

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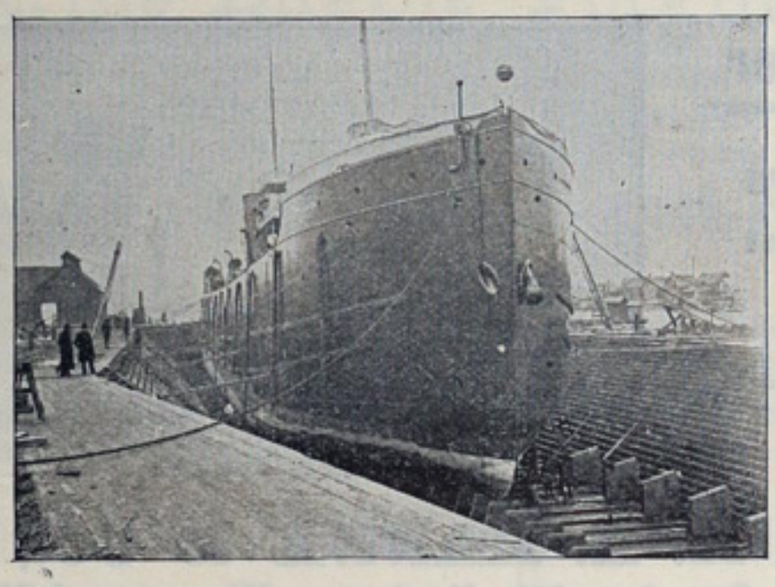

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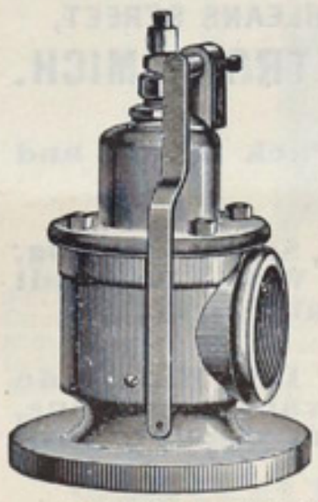

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